COMPARISON OF TRENDS IN SERVICES UTILIZATION FOR HIP FRACTURE PATIENTS: EFFECTS OF THE PRESENCE OF REHABILITATION UNITS

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Table of Contents

Executive Summary i

INTRODUCTION 2

BACKGROUND 2

EXPERIMENTAL DESIGN AND METHODS 9

RESULTS 26

SUMMARY 61

CONCLUSIONS 62

LIMITATIONS 64

FUTURE RESEARCH 64

REFERENCES 66

Appendix A Eligibility Criteria and Medicare Reimbursement 70

Appendix B States by AHA Regions 74

Appendix C Descriptive Statistics 75

Appendix D Figure1: Trend in Proportion of DRG 210 Patients Discharged to Intermediate Care Facilities, Against Medical Advice, or Died 105

Figure 2: Trend in Mean Average Length of Stay (ALOS) for those Discharged to Intermediate Care Facilities, Against Medical Advice, or Died 106

Appendix E Detailed Regression Results: Total Sample 107
Appendix F Detailed Regression Results: Hospitals with No Rehab Units Only 114
Appendix G Detailed Regression Results: Hospitals with Rehab Units Only 121
Appendix H Detailed Regression Results: Hospitals beginning Rehab Units 1986/87 Only 128

Appendix I Table 1: Correlation of Residuals from Regressions for Discharge Destinations, Total Charges, and Average Length of Stay: Hospitals Starting Rehab Units in 1986 or 1987 Only 135

List of Figures

Figure 1 The Open Systems Model. 10

Figure 2 Changes in Proportion of Discharges to Destination by Year. 29

Figure 3 Changes in Average Length of Stay by Destination by Year. 30

Figure 4 Changes in Proportion of Discharges to Destination by Year. (Hospitals with NO Rehab Only.). 31

Figure 5 Changes in Average Length of Stay by Destination by Year. (Hospitals with NO Rehab Only.). 32

Figure 6 Changes in Proportion of Discharges to Destination by Year. (Hospitals with Rehab Only.) 33

Figure 7 Changes in Average Length of Stay by Destination by Year. (Hospitals with Rehab Only.) 35

Figure 8 Changes in Proportion of Discharges to Destination by Year. (Hospitals Starting Rehab in 1986-87 Only.) 36

Figure 9 Changes in Average Length of Stay by Destination by Year. (Hospitals Starting Rehab in 1986-87 Only.) 37

Figure 10 Trend in Proportion of DRG 210 Patients Discharged Home. 38

Figure 11 Trend in Mean Average Length of Stay (ALOS) for those Discharged Home. 40

Figure 12 Trend in Proportion of DRG 210 Patients Discharged to a Skilled Nursing Facility (SNF). 41

Figure 13 Trend in Mean Average Length of Stay (ALOS) for those Discharged to a Skilled Nursing Facility (SNF). 43

Figure 14 Trend in Proportion of DRG 210 Patients Discharged to "Other" (Includes Rehab). 44

Figure 15 Trend in Mean Average Length of Stay (ALOS) for those Discharged to "Other" (Includes Rehab). 46

Figure 16 Trend in Proportion of DRG 210 Patients Discharged to Home Health Services (HHS). 47

Figure 17 Trend in Mean Average Length of Stay (ALOS) for those Discharged to Home Health Services (HHS). 48

Figure 18 Trend in Mean Average Length of Stay (ALOS) for those Discharged to All Destinations. 50

Figure 19 Trend in Deflated Total Charges for DRG 210 Patients. 51

List of Tables

Table 1 Number of Rehabilitation Hospitals and Distinct-Part Units Excluded from the Medicare Prospective Payment System: Fiscal Years 1984-88. 3

Table 2 Operational Definitions of Study Variables 24

Table 3 Correlations between Residuals from Regressions for Discharge Destinations, Total Charges, and Average Length of Stay: All Hospitals 55

Table 4 Correlations between Residuals from Regressions for Discharge Destinations, Total Charges, and Average Length of Stay: Hospitals with No Rehab Units Only 58

Table 5 Correlations between Residuals from Regressions for Discharge Destinations, Total Charges, and Average Length of Stay: Hospitals with Rehab Units Only 60

Executive Summary

This study examined whether care in subacute settings is being substituted for that in the acute care setting for patients with hip fractured during the study years of 1984-90. The primary proposition of the study was that rehabilitation services and acute care hospital services are inversely related. The primary measure of rehabilitation services use was by the discharge destination of "other," the MEDPAR discharge destination that includes rehabilitation units. (The discharge destination "other" includes discharges to rehabilitation hospitals, rehabilitation units, and Veteran's Administration hospitals.) Two hypotheses related to this proposition were tested. The first stated that the average proportion of patients discharged to "other" is inversely related to the average length of stay in the acute care hospital. The second stated that the average proportion discharged to "other" is inversely related to the average deflated total inpatient charge. Although trend analysis supported these hypotheses, when systematic changes in severity and in the environment were controlled for, these hypotheses were not supported in a sample that included hospitals with distinct part rehabilitative units throughout the study period, those that never had them during the study period, and those that began rehab units during the study period. However, analysis of the sub-group of hospitals with rehab units in all study years revealed that discharge to "other" appeared to substitute for acute care services for this group.

Examination of the relationships between discharge destinations disclosed substitutive relationships between discharge to home and to other destinations. The strongest substitution for the entire sample was by home health services, followed by skilled nursing facilities, and "other". The results for the subgroup of hospitals with rehab units in all study years indicated that the strongest relationship again was with home health services, but for this group, "other" had the second strongest relationship, followed by skilled nursing facilities.

The relationship between care in the acute setting (as measured by deflated total charges and average length of stay) and care in other rehabilitative settings, home health services and skilled nursing facilities, were also examined. Complementary relationships were found between acute care services and discharge to a skilled nursing facility for both measures of acute care services. Only a weak complementary relationship was found between discharge to home health services and mean average length of stay. Findings for the rehab comparison group indicated complementary relationships between acute care and discharge to skilled nursing facilities, but no relationship was found in this group between the measures of acute hospitals services use and discharge to home health services.

Conclusions

The widely held perception of Medicare patients being released 'sicker and quicker' in the early years of PPS has had empirical validation in recent years. Reductions in acute

length of stay have resulted in increased use of rehabilitation in subacute settings, in effect substituting care in these settings for that which was previously received in the acute care setting. The concern for the Medicare beneficiary who needs rehabilitative care is that care in all types of subacute settings is not equivalent and that comparable rehabilitative outcomes are not obtained. One implication for the financing of this care is that although the short term costs of acute care and rehab may be lower when rehab care takes place in sites other than the acute setting, rehab hospital or unit, the long term cost may be greater as hip fracture patients may remain in the nursing home on a long term basis, shifting costs from the acute to the long term care sector.

This longitudinal study of the changes in discharge destinations and hospital utilization of hip fracture patients 70+ years of age with comorbidities (DRG 210) over the period of 1984 through 1990 has found dramatic changes. During that period, the proportion of patients discharged home from the acute urban community hospital has dropped from 49.6 percent in 1984 to 21.8 percent in 1990. Even if one adds that proportion of patients discharged to home health to those discharged home with no further care, the decline in those going back to the home setting is substantial (from 55.5 percent in 1984 to 30.4 percent in 1990). This translates into over a 56% increase of hip fracture patients being transferred into an institution rather than the home setting in a six year period.

Study results indicate that a change has occurred and provide a baseline for the scope and magnitude of that change in practice. PPS has had an effect and hospitals have responded to the change in their environment, and several different changes have been identified. This study revealed differential patterns of discharge destinations dependent upon the hospital type, i.e., whether or not the hospital had a distinct part rehabilitation unit. Some hospitals have only changed their acute services. Others have added and incorporated into their systems new technologies; the distinct part rehabilitation unit.

The average length of stay for this diagnosis related group shows a steady decline over the study years, not just an initial substantial reduction with subsequent stabilization found in other PPS studies (Coulam & Gaumer, 1991). This finding reinforces the continuing concern with the appropriateness of timing of discharge from the acute into the rehabilitation setting. In addition, future research should determine whether processes and protocols for DRG 210 have continued to evolve via pressures other than those of PPS. These unmeasured forces should be explicitly identified and controlled in future studies.

Limitations

In this research, we are unable to separate the type of rehabilitation units (orthopedic vs. any other type). Therefore, we were not able to completely isolate the effects of having an orthopedic rehabilitation unit for hip fracture patients. In addition, we were not able to examine whether or not the substitutions were inappropriate. That is, we were not able to measure whether patients were being discharged too quickly into the rehabilitation setting. Nor were we able to assess whether the setting to which the patient was discharged was the appropriate one in terms of resources and intensity of services available. Last, we were not able to separate those discharged to rehabilitation hospitals or units from those discharged to Veteran's Administration hospitals because these destinations are all included in the MEDPAR definition of "other." Future research which examines episodes of care would be able to make those distinctions.

INTRODUCTION

Care following that received in the acute care hospital has been variously described as subacute, postacute, or post-hospital. Relatively little literature exists that addresses changes in the relationship between the use of hospital services and subsequent use of rehabilitation services. The objective of this study was to analyze the relationship between acute hospital services use for hip fracture and subsequent discharge destination to examine changes in the site of rehabilitation for hip fracture patients in the years following the implementation of Medicare's Prospective Payment System to determine whether rehabilitation services were substituting for acute care services. The presence or development of a distinct-part rehabilitation unit in an acute care facility was hypothesized to have an effect on acute length of stay, discharge destination, and total charges. A trend analysis is performed for the years 1984 to 1990. Analysis of residuals from regression analyses is presented to examine whether substitution has occurred.

BACKGROUND

Medicare is the single largest payer for rehabilitative services, paying for over 50% of all discharges from these facilities, accounting for an average of 40% of revenues in rehabilitation hospitals and more than 50% in distinct-part units (Hosek, et al. 1986; Langenbrunner, et al., 1989). Medicare expenditures for rehabilitation services have increased since the implementation of the prospective payment system for acute care hospitals. Expenditures for care rendered in rehabilitation hospitals and units increased from 0.6% of Medicare total inpatient hospital payments in 1984, to 1.1% in 1985, 1.4% in 1986, and 1.5% in 1987 (Langenbrunner, et al., 1989).

A recent examination of the 66 most frequently reported DRGs found that the largest relative increase (2,939 percent) in any DRG was for rehabilitation (DRG 462) between the years 1983 and 1990, reflecting an increase in the number of discharges from 3,510 to 106,680 (Helbing, 1992). Even before the advent of PPS, the number of rehabilitation units in hospitals increased by 93% from 1978 to 1983 (Traxler & Dunaye, 1987). However, following PPS, there was a rapid expansion of organizations providing medical rehabilitation services (Frey, 1989). Table 1 shows the growth of rehabilitation hospitals and distinct-part units from 1984 through 1988.

Table 1

Number of Rehabilitation Hospitals and Distinct-Part Units Excluded from the Medicare Prospective Payment System: Fiscal Years 1984-88

	1984	1985	1986	1987	1988
Hospitals	49	68	79	84	100
Units	308	386	473	535	565

Notes: Numbers reflect totals as of September of each year.
Source: Langenbrunner, et al., 1989.

Rehabilitation services encompass a comprehensive array of restoration services for the disabled and all support services necessary to help patients attain their maximum functional capacity (AHA, 1989). Such services are usually rendered in a post-hospital, subacute setting after an acute hospital stay. Changing Medicare policies have had a significant impact on beneficiaries' utilization of both acute and postacute care. With the implementation of the Medicare prospective payment system (PPS), the average length of stay in acute care hospitals for

Medicare beneficiaries has declined and discharges to postacute care have increased (Neu & Harrison, 1988; Morrisey et al., 1988; Carroll & Erwin, 1987; Sager, Leventhal, & Easterling, 1987; Kenney & Holohan, 1990). Subacute care sites for hip fracture patients reimbursed under the Medicare Part A benefit include home (services provided by a home health agency), skilled nursing facilities (SNF), rehabilitation hospitals, and distinct-part rehabilitation units of acute care hospitals. The Medicare home health agency benefit was designed to provide a less intensive and less expensive alternative to short-stay hospital inpatient care (Helbing, Sangl, & Silverman, 1992). The SNF benefit is intended to reduce the length of stay in acute care hospitals for Medicare beneficiaries who need skilled nursing or rehabilitative services on a daily basis but who no longer require the constant availability of a physician as found in the hospital setting (Helbing & Cornelius, 1992). Distinct-part rehabilitation units are units within acute care hospitals. Four types of hospitals are exempted from the Medicare PPS: rehabilitation hospitals, long-term care hospitals, psychiatric hospitals, and children's hospitals. The exempt units and hospitals have common requirements and particular requirements depending upon type. See Appendix A for the requirements for each of these types of subacute care services.

Although rehabilitation hospitals and units are exempt from the Medicare prospective payment system, they remain susceptible to its effects as acute care hospitals discharge Medicare patients earlier. Patients then admitted to rehabilitation hospitals may have a higher frequency of acute illness, complications, and readmissions to acute care (Heinemann, et al., 1988). The California Association of Rehabilitation Hospitals (1985) conducted a member survey in 1984 and 1985 to examine PPS's effect on care for Medicare rehabilitation patients. Heinemann et al. (1988) summarize the findings reported by Forer (1985):

> "1) that time from disability onset to rehabilitation admission was shorter; 2) patients were admitted to rehabilitation hospitals with a more acute level of severity; 3) more referrals were coming from a wider range of sources; 4) no change in test information and results from acute care hospitals was observed; 5) fewer CT scans were completed before

> rehabilitation; 6) Medicare length of stay in rehabilitation was shorter or the same, whereas nonMedicare length of stay remained the same; 7) the transfer rate from rehabilitation hospital units was higher or the same; 8) more frequent and thorough peer reviews and reviews by fiscal intermediaries were conducted; 9) closer review by inhouse utilization reviews were conducted to identify potential payment denials; and, 10) increased therapy staffing was developed for outpatient programs and home health programs" (Heinemann et al., p. 615, 1988).

Adverse outcomes included "1) more inappropriate referrals to rehab; 2) referral of more acutely ill patients; 3) a decrease in medical stability; and 4) pressure to admit patients sooner" (Heinemann et al., p. 615, 1988).

A study conducted by Morrisey et al. (1988a) examined Medicare patients in 501 hospitals and their subsequent transfers to postacute care using data from the Commission on Professional and Hospital Activities (CPHA) from years prior to and following the implementation of the Medicare Prospective Payment System. Among the DRGs they analyzed were DRGs 209-212, major joint procedures, and hip and femur procedures. Findings include: 1) longer average length of stay in larger hospitals before transfer to subacute facilities; 2) teaching hospitals had shorter average length of stay before transfer than nonprofit, nonteaching facilities; 3) hip and major joint patients in investor-owned facilities had consistently shorter lengths of stay before transfer; 4) hip and major joint patients in metropolitan areas had shorter pretransfer stays; and, 5) sole providers had longer pretransfer lengths of stay. The presence of a secondary diagnosis was found to lengthen the stay while severity within the DRG was found to shorten the stay. Another report of this analysis found that the proportion of Medicare patients transferred to postacute care doubled after PPS (Morrisey, Sloan, & Valvona, 1988b). They linked increasing case-mix severity of Medicare patients transferred to nursing home facilities to PPS.

Determinants of Postacute Care Utilization. A few studies have examined the joint effect of patient (microlevel), hospital, and community (macrolevel) attributes on the use of postacute care services (Benjamin, 1986; Morrisey et al., 1988a; Morrisey et al., 1988b; Harrington & Swan, 1987). Neu and others (1989) used personal and medical market area characteristics to explain variations in Medicare postacute care utilization (Neu et al., 1989). They found that skilled nursing facility (SNF) services and home health care appear to be substitutes for each other. Substitution here was defined as a substitute in practice, as this study did not assess whether these two types of services were medical substitutes. They also suggest that the availability of SNF beds in metropolitan areas has a negligible effect on the variation in use of postacute care. Thus, the impact of SNF bed supply on postacute care use by Medicare patients has not been sufficiently demonstrated. However, they also found that SNF substitutes for acute care for some diagnoses and suggest that additional research needs to be done to understand better the types of cases where SNF care can serve as a practical medical substitute. Home health services appear to complement acute care services for patients who remain longer in the hospital in some cities. Overall, they observed "that places with relatively little of one type of postacute care are characterized by relatively heavy utilization of other kinds of postacute care" (Neu, et al., 1989, p. vii).

Hip Fracture Studies

Substantial in-hospital rehabilitation has contributed to the successful treatment of hip fractures. However, recent evidence suggests that the quality of care for hip fracture patients [illegible] declined since the advent of the prospective system. Fitzgerald and others (1988) found in their study of elderly persons admitted to a large community hospital from 1981 to 1986: 1) the mean length of hospitalization decreased, 2) patients were discharged more often to the nursing home, and 3) after one year, patients were more likely to remain in nursing homes. The findings of this study also indicated that patients having surgery for hip fracture had 50% fewer in-hospital therapy sessions after institution of PPS as before while an increased number were discharged to a nursing home for rehabilitation. A concomitant decrease in favorable outcomes was seen at one-year after hospital discharge. After PPS, 33% of hip fracture patients, compared to 9% of hip fracture patients before PPS, remained in the nursing home. These types of responses to PPS may have significant implications for changes in utilization patterns as cost of care for Medicare beneficiaries increases and long-term care providers exercise their option to admit lighter care, private pay patients and more patients are discharged to rehabilitation hospitals and units.

Bonar and her colleagues examined patient characteristics associated with a short stay versus a long stay in a skilled nursing facility for those with a diagnosis of hip fracture (Bonar, Tinetti, Speechley, & Cooney, 1990). They examined discharges from two hospitals between 1983 and 1986. Only discharges admitted from the community and discharged to an SNF were included in the study. This number constituted only 21% of individuals who were admitted from the community. Patient characteristics that serve as risk factors for permanent institutionalization were identified. At six months, 33% were still institutionalized. This included: 1) 7% of those with fewer than two of five patient characteristics, 2) 36% of those with two or three characteristics, and, 3) 82% of those with four or five characteristics. For those patients in the intermediate category, the number of physical therapy hours was found to have an effect on discharge status where a statistically significant higher percentage of patients in SNFs with greater than 50 hours of PT/100 beds were discharged home. This research suggests that risk factors for permanent institutionalization can be identified at acute discharge and that further research should be done to ascertain whether more intensive rehabilitation and discharge planning will increase the likelihood of returning home for a large percent of hip fracture patients (Bonar, et al., 1990, p. 1139).

Palmer and his colleagues replicated the study design of Fitzgerald et al. (1987, 1988), studying the experience of 386 Medicare beneficiaries with hip fractures in a private, suburban teaching hospital during the years 1981 through 1987 (Palmer, et al., 1989). They found: 1) the mean acute length of stay decreased from 17.0 to 12.9; 2) a decrease in the mean number of physical therapy sessions, from 11.1 to 9.8; 3) an increase in the mean number of physical therapy treatments per day, from 1.2 to 1.4; 4) the proportion of patients discharged to nursing homes did not change (52.9% before PPS compared to 53.6% after); 5) no significant difference was found between the proportions of patients institutionalized at six months (22.6% vs 19.9%); 6) total adjusted average hospital charges were not different in the pre- and post- periods; and, 7) no difference in the 6-month ambulation status was found.

Timing of Referrals

A stay in an acute care setting usually precedes the use of rehabilitation services. The timing of referral from the acute setting to rehabilitation will affect the overall cost of rehabilitative services (Hosek, Kane, Carney, et al., 1986). However, this movement is not always in a one-way direction, as rehabilitation services may be interrupted by conditions that require transfer back to the acute setting (Hosek, et al., 1986). In a study of changes in medical stability upon admission to a free-standing rehabilitation facility before and after PPS, Marciniak and her colleagues found an increase in the percentage of patients who were transferred back to the acute setting within one day of admission due to a medically unstable condition (Marciniak, Heinemann, & Monga, 1993). The timing of referral also appears to differ depending upon whether rehabilitation services are provided in a free-standing or a distinct-part unit of an acute care hospital. In addition, readmission patterns also differ by diagnosis as stroke, brain injury, and hip fracture patients are infrequently readmitted while spinal cord injury and amputation patients are more likely to be re-admitted and such re-admissions may be part of their plan of care (H al., 1986). Therefore, a focus on utilization patterns of individuals with diagnoses that historically have infrequent readmissions is more appropriate in the examination of substitution of rehabilitation services for acute care hospital services.

EXPERIMENTAL DESIGN AND METHODS

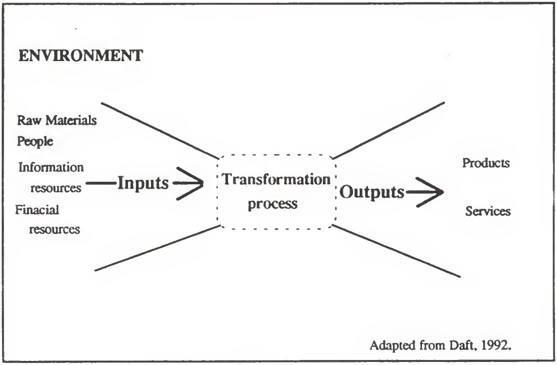
A study to determine whether organizational behavior has changed in response to the environment must focus upon the organization as the unit of analysis. In this study, the objective was to determine if hospitals have responded to the increased financial pressures of PPS to substitute rehabilitation services that are still reimbursed using the cost-plus methodology for acute hospital services. The underlying hypothesis was that hospitals change their processes in response to changes in the environment.

Conceptual Framework

General systems theory (von Bertalanffy, 1956; Boulding, 1956) offers a useful framework to study many types of self-organizing systems, including organizations in general (Daft, 1992; Miller, 1978), and health service organizations in particular (Shortell & Kaluzny, 1994; Stegall, 1991; Wan, 1995). Modern organization analyses focus upon the branch of general systems theory dealing with open systems. Open systems are those systems that are dependent upon the environment for their production inputs. Inputs acquired from the environment undergo a transformation process to become the outputs, the products and services, that are exchanged with entities in the environment for more inputs. The open systems model (Figure 1) assumes that organizational structures and processes flexibly response to external changes in the environment (Daft, 1992).

Hospitals do not represent a homogeneous population, a fact recognized both by the American Hospital Association (AHA) and by the Health Care Financing Administration (HCFA). In its 1989 annual survey of hospitals, the AHA (1990) classified hospitals into 18 different control codes that described the type of authority responsible for the operation of the hospital. The four major types were government, federal and nonfederal; and nongovernment, not-for-profit and for-profit. Hospitals were classified based upon the major services they provide, i.e.,

Figure 1. Open Systems Model.



Adapted from Daft, 1992.

general medical and surgical, psychiatric, or children's services. In 1989, there were 22 different service classifications of hospitals in the AHA survey. Furthermore, hospitals are classified based upon whether they are located in an urban area, their bedsize, their medical training function, and whether or not they operate distinct units such as rehabilitation units, long-term care units, or psychiatric units.

These distinctions are important because HCFA (Health Care Financing Administration) uses different payment mechanisms to pay different types of hospitals and units (Federal Register, 1987), effectively placing the various types of hospitals and distinct units in different operating environments. In addition, HCFA distinguishes whether the organization is operating in an urban or rural area. Because of the variety of hospitals operating in a variety of environments, a variety of organizational responses is a logical hypothesis.

Although the intent of PPS was for hospitals to change their processes, general systems theory suggests that organizations may, in addition, change their structures. For example, one strategy, for a hospital that has found the reimbursement environment of PPS to be harsh, is to acquire or develop distinct units which HCFA still reimbursed under the more liberal TEFRA policies. The organization, which is now more than just a hospital, avails itself of the ability to capture more inputs from the environment. This process brings into one organizational entity incentives that were directed at two different types of entities. The required processes for this new organization to maximize its effectiveness may differ sharply from effective processes found in stand-alone hospitals. Processes that were optimal for a stand-alone hospital may be suboptimal for the hospital entity that has acquired a distinct unit. The possibility that these new hospital entities will recognize and eliminate suboptimal processes is enhanced because of the spread of the continuous quality improvement (CQI) movement throughout the hospital industry. Systems thinking and the elimination of suboptimal processes are foundational concepts in CQI (Deming, 1993).

It is thus hypothesized that hospitals will respond to the changes in the reimbursement system based upon their abilities to maximize their profitability by optimizing the total hospital system. Hospitals that do not change their structure will change processes to align themselves with the environmental incentives. Hospitals that change their structure will eventually align their more complex processes with the new combination of environmental incentives they face.

Variable Classes

From the theory discussion above, four classes of variables are identified: inputs, throughputs, outputs, and environment. Throughputs, in this study, are divided into the subclasses of structure and processes. This is the result of overlaying Donabedian's structure/process/outcomes theory over the general systems model to further delineate the importance of different organizational variables upon the clinical outcomes.

Inputs. The input variables used in this study focus upon describing the variance in the primary input, the patient. Variables that describe the incoming patient include the patient's age, gender, primary DRG, and number of other diagnoses.

Structure. These patients enter a variety of different types of hospitals, and these types are associated with the organization's structure and processes. First, the different AHA [illegible] and control codes offer macro level identifiers for the types of hospitals to which patients have been admitted. Other structural variables include the organization's size, whether the organization is just a hospital or the organization is a hospital with distinct-part units such as a rehab unit or a nursing home, and whether a hospital is associated with a medical school. Also, organizations may differentiate structurally if they have developed product lines for particular types of patients.

Process. By focusing upon a particular type of patient, one may differentiate the processes used by the organization based upon the outcome of the patient. In other words, the processes used on patients that are discharged home may differ from those that are discharged to a skilled nursing facility. Other process measures include items such as average number of surgeries for a type of DRG or how often such ancillary services, such as physical therapy, are used in conjunction with the patient's treatment. Total charges for a patient and their length of stay are both overall indicators of the interaction between patient type, hospital type (structure), and processes used to treat the patient. These variables are overall indicators of the intensity and duration of the throughput phase.

Outcomes. Outcome measures reflect the changes in the inputs. A gross measure in this dimension would include the probable discharge destinations of patients being discharged from a hospital after treatment for a particular DRG. After controlling for differences in patient inputs, outputs are expected to vary among organizations because of differences in the organizational structure, processes, and environment.

Environment. Measures of the organization's environment include variables such as whether the hospital is operating under PPS or TEFRA, in which region of the country it is located, and whether that location is in an urban or rural setting. In time series studies, it is also important to recognize that the environment changes over time due to economic cycles and due to the implementation of new rules and definitions. For example, the implementation of PPS has, over time, moved from a hospital-based standard of reimbursement to a national standard. This phase-in period represents a transition in the intensity level of PPS upon the organization. Time, in this case, becomes a variable in measuring the hospital's environment.

The environment also varies from hospital to hospital. For example, children's hospitals, which are highly dependent upon Medicaid, are not as sensitive to changes in Medicare as general acute medical hospitals treating a population that is largely age 65 and over. Thus, if a study is focusing upon changes in one type of organizational environment to determine whether the environment is affecting throughputs and outputs, it is logical to try to measure how strongly linked the hospital is to that particular environment. For example, the percentage of a hospital's inpatient days that are paid for by Medicare would represent the degree that hospital is likely to respond to changes in Medicare.

Although theory has suggested several classes of variables, the individual indicators used to represent a class may, in actuality, represent more than one class of variables. Patient age and gender can be considered measures of the variance in the hospital patient inputs, but indirectly, they may also indicate in what type of environment the hospital is operating. Certain indicators of hospital structure, such as whether the institution is a teaching hospital or not, may also be correlated with the hospital's type of environment. On the other hand, an environmental variable such as the changing level of the relative weight of a DRG not only indicates the changing level of environmental pressure on the organization, it may also be an indicator of a change in DRG definition. Thus, this indicator would indicate both environmental pressure and a change in type of inputs when a study is based upon a particular DRG.

Variables

Since regression analysis was be used in this study, additional variables were derived by taking the natural logarithm of the interval variables. This transformation process is simplified since the values of all variables were all equal to or greater than zero. Specifically, proportions were transformed by multiplying the proportion by 20 and adding one to the product, the new variable being the natural logarithm of this result. Other interval variables were created by adding one prior to taking the natural logarithm.

Study Question, Proposition, and Hypotheses

The study question, again, is "Have hospitals, in response to the implementation of PPS, substituted rehabilitation services for acute hospital services?" General systems theory was used to frame this question and suggests that variances in inputs, throughputs (both structure and process), and environment must be controlled before this question can be answered. After controlling for these items, the proposition may be stated as, "Rehabilitative services and acute hospital services are inversely related."

In this study, the use of rehabilitative services is measured by the percentage of the hospital's discharges that are classified as "other" in the MEDPAR data set for each year. (This destination includes rehabilitation hospitals and units as well as Veteran's Administration Hospitals.) Acute hospital services are measured in two ways: 1) the average length of stay of patients discharged in a year and 2) the average deflated total inpatient charges for discharged patients in a given year.

The two different measures for acute hospital services thus required the testing of two different hypotheses. Those hypotheses were, that after controlling for the variances in inputs, throughputs (both structure and processes), and environment, that:

H_1: The proportion discharged to "other" is inversely related to the average length of stay.

H_2: The proportion discharged to "other" is inversely related to the average deflated total inpatient charge.

Similar hypotheses were tested for the other two postacute, rehabilitative settings, home health services and skilled nursing facilities.

DRG Chosen for Analysis

The purpose of this study is to examine trends in the relationship between acute care hospital and subsequent site of rehabilitation in order to determine if a substitution of rehabilitation services for acute care hospital services is occurring. Therefore, a diagnosis which does not require frequent re-hospitalizations, but does require subsequent rehabilitative services in a postacute care setting is best for examination here. To identify a diagnostic condition (DRG) associated with a high risk of nursing home placement and premature death, with a high level of use of postacute services, and with a better prognostic outcome after hospitalization, the study design targeted Medicare patients with the tracer condition of hip fracture. Hip fracture is chosen as a tracer condition for this study because of its frequent occurrence, diagnostic specificity, and burden of illness in the elderly. Hip fractures cause considerable mortality, disability, and expense for the elderly person. A recent study from the Institute of Medicine (IOM) reports that there are approximately 260,000 hip fractures yearly in the United States and these occur almost exclusively in the elderly (IOM, p. 10, 1990). In the population over 65 (n=31,800,000), the annual incidence of hip fracture is 8.2/1,000. The IOM study cites an estimated yearly cost of $6 billion for direct medical care for hip fracture patients, the bulk of which is reimbursed by Medicare or Medicaid. Hip fracture is also an appropriate condition with which to examine the relationship of acute to rehabilitative services as the acute phase is universally treated in hospitals (IOM, p. 6, 1990).

A surgical Diagnosis Related Grouping, DRG 210 was chosen for the trend analyses. DRG 210 was one of the DRGs found by Meiners and Coffey (1985) to be one of the most commonly transferred to the nursing home in their Maryland data. Kenney and Holahan (1990) included DRG 210 in their study of the nursing home market and hospital discharge delays which examined the 16 DRGs that most commonly lead to post-acute care use. The definitions for DRG 210 during the time frame of the study period follow:

1983	Hip and femur procedures except major joint age > 69 and/or complications and comorbidity
1987-90	Hip and femur procedures except major joint age >17 with complications and comorbidity

Since the definition of DRG 210 changed during the study period, the criteria for the most limited data year was used and the data for younger age groups were deleted so that only those age 70 and above were included in all study years in order that the final dataset would reflect the same ages across all study years.

In 1987, age restrictions were removed from 39 percent of all of the then 477 DRGs (Latta and Helbing, 1991). This redefinition of DRGs by the removal of age restrictions affects this study in that DRG 210 and DRG 211 were both affected, resulting in some cases that were in 1987 considered DRG 210 to be subsequently classified as DRG 211. Specifically, in 1987, all patients with comorbidities, regardless of age, were classified as DRG 210. In addition, patients without comorbidities who were 70 or greater in age were classified as DRG 210. In 1988 and after, this latter group was placed into DRG 211 (Federal Register, September 1, 1987).

The effect of this change is that, after 1987, all patients classified as DRG 210 have comorbidities, thus it is assumed that the overall severity level for the DRG increased. However, the numbers of patients 70+ in age and having no comorbidities is assumed to be a small number. In addition, the increase in severity is controlled for in the regressions used in this study by including the DRG's relative weight measure as an independent variable. Evidence supporting the use of the DRG 210 relative weight to control for the changes in the definition was found in examining the geometric mean length of stay for both DRG 210 and DRG 211 during the study period. In the three years prior to changing the age restrictions, DRG 210 cases yearly exceeded the geometric mean length of stay of DRG 211 cases by 1.9 days. In the three years following the definition change, the difference between the two DRGs ranged from 2.4 to 2.6 days; averaging 2.5 days. This one time increase in the difference in the mean length of stay between the two

DRGs of 0.6 days (2.5-1.9) occurs with the change in the DRG definition. It also corresponds with a one time 7.2% increase in the relative weight of DRG 210, the only increase in relative weight for either DRG 210 or DRG 211 in the study period (Federal Register, August 31, 1984; September 3, 1985; September 3, 1986; September 1, 1987; September 30, 1988; September 1, 1989; September 4, 1990, August 30, 1991).

DRG 210 includes the following operating room procedures:

7705	Femoral sequestrectomy
7725	Femoral wedge osteotomy
7735	Femoral division NEC
7785	Partial ostectomy-femur
7795	Total ostectomy-femur
7805	Bone graft to femur
7835	Femur length change
7845	Oth femur repair/plastic
7855	Internal fixation-femur
7875	Osteoclasis-femur
7895	Insert bone stim-femur
7915	Closed red-int fix femur
7925	Open reduction-femur fx
7935	Open reduc-int fix femur
7945	Close reduc-femur epiphy
7955	Opn red-sep ephiphy-femur
7965	Debrid opn fx-femur
7985	Open reduc-hip dislocat
7995	Femur injury op NOS
8005	Arthrot/pros remov-hip
8015	Oth arthrotomy-hip
8045	Hip structure division
8075	Hip synovectomy
8095	Excision of hip NEC
8121	Arthrodesis of hip
8140	Repair of hip, NEC
8312	Adductor tenotomy of hip

Study Design

The study design was developed to explore existing data sources in order to examine trends in short stay hospital and rehabilitation facility utilization for Medicare cases that frequently require rehabilitation services. The study design that follows uses an organizational level analysis. This was done since it is the behavior of the organization, in this study, the hospital, that affects the substitution of one kind of service for another. A total of three groups, two that had or developed rehabilitation units, and a comparison group--which included hospitals that never developed rehabilitation units, are compared to examine trends over time for the dependent variables examined in this study.

Study Time Frame

The time period for the study, 1984-1990, was constrained due to data limitations. While it would have been preferable to have a series of pre-PPS years, prior to 1984 the MEDPAR data included only a 20% sample of all Medicare Part A discharges and diagnoses were recorded differently.

Study Groups

The organizational analysis examines differences in trends in acute length of stay, discharge destination, and deflated total charges among hospitals that 1) had or 2) developed rehab units after the advent of PPS and 3) hospitals that did not develop these units. This study includes only rehabilitation facilities that are distinct-part units of hospitals. Although the NARF (National Association of Rehabilitation Facilities) distinguishes three types of rehabilitation facilities--free-standing hospitals, rehabilitation facilities that are part of a multihospital complex, and those that are a unit in a single hospital facility, HCFA uses a two-way classification, classifying most of the parts of complexes as units, although some may be considered free-standing hospitals. (Units are the smallest type of facility and are the least likely to have training/residency programs (Hosek, Kane, Carney, et al., p. 13, 1986).)

Description of the Study Groups

The first study group consists of hospitals who did not have distinct part rehabilitation units in 1984 and 1985, but created them in 1986 or 1987. This group was assumed to be composed of hospitals that created exempt, distinct part units in order to take advantage of the cost-based reimbursement for service provision. The second comparison group consists of those who had distinct part rehabilitation units in 1984 and throughout the study period. These two types of groups were distinguished because their behavior may differ due to the integration of the rehabilitation unit into the hospital processes and structure. The third study group includes hospitals who had no distinct part rehabilitation units over the study time frame. This group was included in order to control for extraneous factors that may affect trends in discharge destination, length of stay, etc., that are not attributable to simply having a distinct part rehabilitation unit in the hospital.

In order to identify trends more clearly and to ensure the integrity of the design, each hospital was examined in each study year in order to ascertain whether or not a rehabilitation unit was present and to determine in which study year the rehabilitation unit was developed before a hospital was assigned into a study group. Hospitals may have had units in 1984, 1986, or 1987, but closed or changed the type of unit in subsequent years. These hospitals were eliminated from the analysis in order to increase the homogeneity of each study group.

Sample

The population chosen for this study consisted of all short-term, general, acute care hospitals in the United States. The American Hospital Association (AHA) data file was used as the sampling frame to select the study sample. Approximately 91% of all short-term, general, acute care hospitals in the United States belonged to the AHA in 1990.

Exclusion criteria. Hospitals in states with Medicare waivers (Maryland, New York, Massachusetts, and New Jersey) were excluded from the analysis because they were not under the same payment conditions as the rest of the sample throughout the entire study period. In addition, only hospitals in urban areas (MSAs) were included in order to control for differences in trends due to the nonavailability of all types of rehabilitation care (i.e., skilled nursing facilities, free-standing rehabilitation hospitals, outpatient rehabilitation services, etc.). It is assumed that all types of rehabilitation care will be available in urban areas whereas rural settings may have limited access to rehabilitation services other than those offered in the skilled nursing facility. Other excluded hospitals in the AHA dataset were those in the Marshall Islands, Puerto Rico, the Virgin

Islands, Guam, and American Samoa. Additional exclusion criteria included: a hospital-year in which the hospital had fewer than 15 discharges in DRG 210 of patients greater than or equal to 70 years of age; the hospital was not under the Prospective Payment System; and hospitals that did not meet the criteria for inclusion into one of the three defined study groups.

AHA Data

This data base is collected annually using a self-reporting survey form and is reported in the AHA publication Hospital Statistics, 1990 Edition.

MEDPAR Data

Although the data has limitations in terms of patient-level information, HCFA administrative data was used in the analysis. MEDPAR (Medicare Provider Analysis and Review File) is a 100% file of Part A inpatient care. It has person-level data with unique identifiers that allow the identification of a subset of individuals who have received inpatient services related to the diagnosis of hip fracture. This data was linked with the American Hospital Association data file by Medicare provider number. The patient level data from the MEDPAR files were aggregated to the level of the hospital in order to perform an organizational analysis. Again, this was done since it is the behavior of the organization, in this study, the hospital, that affects the substitution of one kind of service for another. A major limitation of the MEDPAR data is that it contains no information on functional status, therefore, no statistical control for functional status was available for the analysis.

Sample Size Diminution

It was not until 1989 that the AHA dataset began reporting the Medicare provider number. Thus, this study utilizes the 3893 general medical and surgical hospitals identified in 1989 for this study. The seven year study, with a potential of 3893 hospitals each year, implies 27,251 hospital-years of observations. The study actually utilizes 7456 hospital-years.

Because any one hospital-year may be characterized by several exclusion criteria, the magnitude of the following exclusion results does not necessarily represent the prevalence of that characteristic, except for the first one. That criteria is that if a hospital did not have a DRG 210 discharge where the patient was 70 or greater in age, then that hospital-year was dropped from the study. There were 2115 such cases during the study period. Simple data duplications in either the MEDPAR or AHA datasets then resulted in another 369 hospital-years being eliminated.

The exclusion of rural hospitals resulted in another 9700 hospital-years being eliminated from the study and the elimination of hospitals not under the PPS system eliminated 1609 hospital-years. Given the prior exclusions, the elimination of the hospitals in the waiver states now only reduced the study sample by 1120 hospital-years.

Several data elements are estimated by the American Hospital Association if a member hospital does not return a survey. Another 364 hospital-years were eliminated from the study because the survey was not returned.

All hospital-years that did not include 15 or more DRG 210 cases of age 70 or greater were eliminated from the study. With 15 or more cases, the overall discharge patterns suggested that each hospital should discharge at least one case to each discharge destination. This criteria reduced the study sample by 3205 hospital-years.

Finally, this study focused upon three sub-groups of hospitals, those with a rehabilitation unit for all seven years of the study, those that began and continued such a unit in 1986 or 1987, and those that did not have a unit any time during that seven year period. All hospitals that did not meet these three criteria or had missing data were eliminated from the study. This final reduction of 1313 hospital-years results in the final study size of 7456 hospital-years. Hospitals without a rehab unit during the entire period are represented by 5764 of these hospital-years. Hospitals with a unit throughout the period constitute 1098 hospital-years. The remaining 594 hospital-years come from those hospitals that began a rehab unit in either 1986 or 1987.

At this level, this study includes the data from 301, 689 DRG 210 cases for the seven years of the study. MEDPAR data from five of those years indicates that this study contains about 43% of all the Medicare DRG 210 cases for the seven year period after the above exclusions.

The second part of this study that utilizes the regression technique is completed with fewer cases. Hospitals that did not discharge a patient to a rehab setting ("other"), home, or to a skilled nursing facility were eliminated resulting in a reduction to 3428 hospital-years and 155,132 DRG 210 cases. This was necessary because of data problems associated with model specification and censored data.

Measurement

The operational definitions for the variables used in the analysis are seen in Table 2.

Table 2
Operational Definitions of Study Variables

Variable	Definition
INPUTS[1]	
AGE	Mean age, by category from the MEDPAR file 5=70-74 6=75-79 7=80-84 8=85-90 9=90 and over
OLD	Percent over age 80
GENDER	Percent female
NODX	Mean number of diagnoses
THROUGHPUTS	
Structure (Hospital Characteristics)	
C_STGOV	Percent governmental
C_NFP	Percent not-for-profit
C_FP	Percent for-profit
SNFBED	Percent with SNF beds
REHBBED	Percent with rehab beds
IBSC	Mean number of acute care beds
TEACH	Percent teaching
DRG210D	Mean proportion of inpatient days that are DRG 210 inpatient days
Process[1]	
NDIS	Mean number of DRG 210 discharges
NUMSURG	Mean number of surgeries per case
TNOUTPT	Mean number of patients with outpatient charges
PEROUTPT	Mean percent of patients with outpatient charges
DEOUTPT	Mean outpatient charges (deflated)
TNPTCH	Mean number of patients with physical therapy
PERPT	Mean percent of patients with physical therapy charges
DEPTCH	Mean physical therapy charge (deflated)
LOS	Average length of stay for DRG 210

Sources: [1] MEDPAR, 1984-90
[2] AHA Data--American Hospital Association Surveys, 1984-90
Variables are directly from or calculated using variables from these datasets.

Table 2 (continued)
Operational Definitions of Study Variables

Variable	Definition
Process [1](continued)	
Average length of stay by discharge destination:[2]	
XHOMEDAY	Discharged home
XSNFDAY	Discharged SNF
XOTHDAY	Discharged "other" (includes rehab)
XHHSDAY	Discharged home health
XRESTDAY	Discharged all others
OUTPUTS[1]	
DSTHOME	Discharged home
DSTSNF	Discharged SNF
DSTOTH	Discharged "other" (includes rehab)
DSTHHS	Discharged home health
DSTREST	Discharged all others
DETOTCH	Mean total charges per case (deflated)
ENVIRONMENT[2]	
EMCRDEP	Medicare inpatient days as a percent of total inpatient days
OUTLIER	Length of stay outlier cutoff points used by PPS for each year
RELWT	Relative weight factor used with DRG 210 by PPS each year
Percent by Region:[3]	
REG_NE	New England
REG_MA	Mid-Atlantic
REG_SA	South Atlantic
REG_ENC	East North Central
REG_ESC	East South Central
REG_WNC	West North Central
REG_WSC	West South Central
REG_MTN	Mountain
REG_PAC	Pacific

Sources: [1] MEDPAR, 1984-90

[2] AHA Data--American Hospital Association Surveys, 1984-90 Variables are directly from or calculated using variables from these datasets.

[3] Appendix B contains the states in each of the AHA regions.

Discharge destination is one of the primary dependent variables examined in this study. Changes in the percentage distributions of the various categories of discharge destination were used as the measure of outcome.

Discharge destination categories (percent by discharge destination):

Percent discharged home
Percent discharged skilled nursing facility
Percent discharged to "other" type of facility (includes rehabilitation hospitals and units as well as Veteran's Administration Hospitals)
Percent discharged to a home health agency
Percent discharged to short-term hospital
Percent discharged intermediate care facility
Percent discharged against medical advice
Percent discharged dead

The last four categories were combined into one category labeled "rest."

RESULTS

In addition to trend analyses and analysis of residuals reported in the following sections, two additional descriptive studies were performed. These are contained in Appendix C. The first uses three study years to examine the differences between study and non-study hospitals. These comparisons are made between groups which differ on the final exclusionary criterion of number of DRG 210 discharges. Hospitals with 15 or more discharges for DRG 210 in a study year remain in the study sample for that year, hospitals with less than 15 DRG 210 discharges in any study year are excluded. Since hospitals not under the prospective payment system were excluded from the study sample, the 1984 cross-sectional sample had the lowest sample size because of the progressive implementation of PPS. Due to the change in definition of DRG 210 in 1987, comparisons are also made in that study year. Last, comparisons were also made in 1990, the final study year. The second descriptive analysis used analysis of variance to compare input, throughput, output, and environmental differences between the study groups. An additional comparison group was included in the ANOVAs, the excluded hospitals with 15 or more discharges who did not fit into one of the three groups (referred to as the excluded group), never had rehab (referred to as the no rehab group), rehab starting in 1986/87 (referred to as the rehab87 group), or rehab in all years (referred to as the rehab group). Again, this descriptive analysis was done for the years 1984, 1987, and 1990.

In the following sections, first the trend analyses are presented to graphically compare changes in the average proportions discharged to each of the discharge destinations over the study period. Second, analysis of residuals from the regression analyses are presented to examine whether substitution has occurred.

Trend Analysis

This section examines first the trends for the entire, combined study sample and then the plots of trends by study groups in average proportions of hip fracture patients discharged to each of the discharge destinations, in average length of stay by discharge destination, in overall average length of stay, and in average total deflated charges. All of these trends must be viewed bearing in mind the change in definition for DRG 210, effective October 1, 1987, which placed all patients with complications and comorbidity into DRG 210 and changed the age criterion. However, as previously discussed, this change affected only a small percentage of DRG 210 cases that were not addressed by equalizing the age groups included in all study years.

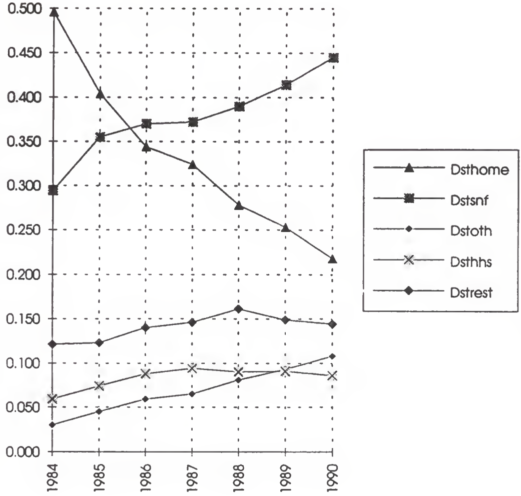
Overall Trends

Figure 2 shows the trends during the study period in mean proportions of discharges for each of the discharge destinations for the total, combined sample (n=7,456 hospital-years). A rapid decline in the mean proportion discharged home is observed throughout the study time frame. The most remarkable shift in proportions comes in 1986, when, for the first time, the mean proportion discharged to a skilled nursing facility exceeds that discharged home. The discrepancy between these two proportions continues to widen throughout the rest of the study period. This pattern is interesting to examine in conjunction with that observed for the trends for mean average length of stay as depicted in Figure 3. As the mean average length of stay continues to decline (with a slight upward blip in 1988) for those discharged home, the mean average length of stay for those discharged to an SNF varies only slightly throughout the study period. The mean proportion discharged to the destination, "other", which includes rehab units, continued to rise over time (Figure 2), overtaking the proportion discharged to home health services in 1989, to rise above it in 1990.

Figure 4 contains the trends for the group of hospitals which had no rehab units in any study year. These trends mirror those of the combined sample since this group is the largest of the subgroups (n=5,764 hospital-years). The only exception to the overall pattern of the combined sample is the relationship between the proportions discharged to home health services and the proportions discharged to "other". For the no rehab group, the mean proportion discharged to "other" does not rise above home health services until 1990. Figure 5 shows the trends in average lengths of stay for this group which again appear similar to the entire combined sample.

A different pattern appears in the examination of the plots of trends for hospitals with rehab units over the entire study period (n=1,098 hospital-years) as seen in Figure 6. For these hospitals, it is not until 1988 (after the definition change) that a higher percentage of discharges are going to a skilled nursing facility than home. The plot also shows that, for these hospitals, the

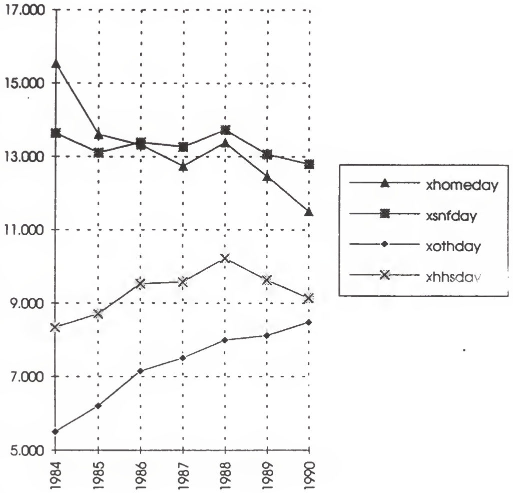
Figure 2. Changes in Proportion of Discharges to Destination by Year.



Changes in Proportions Discharged to Destinations by Year.

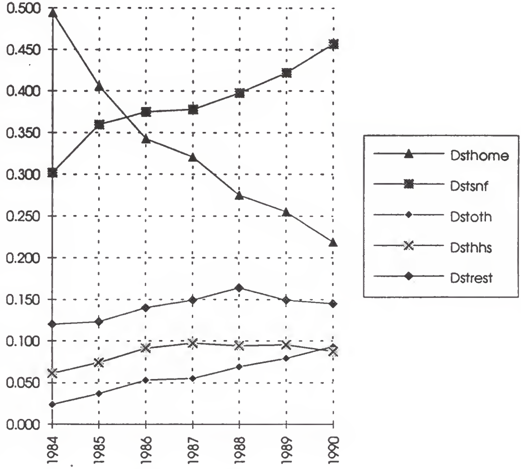
Year	Dsthome	Dstsnf	Dstoth	Dsthhs	Dstrest
1984	0.496	0.294	0.030	0.059	0.121
1985	0.404	0.355	0.045	0.074	0.123
1986	0.344	0.370	0.059	0.088	0.140
1987	0.324	0.372	0.065	0.094	0.146
1988	0.278	0.390	0.081	0.090	0.161
1989	0.253	0.414	0.093	0.091	0.149
1990	0.218	0.445	0.108	0.086	0.144

Figure 3. Changes in Average Length of Stay by Destination by Year.



Changes in Average Length of Stay, by Destination and Year.					
Year	xhomeday	xsnfday	xothday	xhhsday	xrestday
1984	15.538	13.635	5.500	8.343	13.819
1985	13.596	13.107	6.207	8.712	13.125
1986	13.318	13.389	7.155	9.537	12.902
1987	12.741	13.263	7.506	9.580	12.784
1988	13.379	13.721	7.999	10.220	13.674
1989	12.464	13.060	8.120	9.633	13.043
1990	11.509	12.799	8.483	9.146	12.049

Figure 4. Changes in Proportion of Discharges to Destination by Year. (Hospitals With NO Rehab Only)



Changes in Proportions Discharged to Destinations by Year.
(Hospitals With NO Rehab Only)

Year	Dsthome	Dstsnf	Dstoth	Dsthhs	Dstrest
1984	0.494	0.302	0.024	0.061	0.120
1985	0.406	0.360	0.037	0.074	0.123
1986	0.343	0.375	0.053	0.091	0.140
1987	0.321	0.378	0.055	0.097	0.149
1988	0.275	0.398	0.069	0.094	0.164
1989	0.255	0.422	0.079	0.095	0.149
1990	0.219	0.457	0.093	0.087	0.145

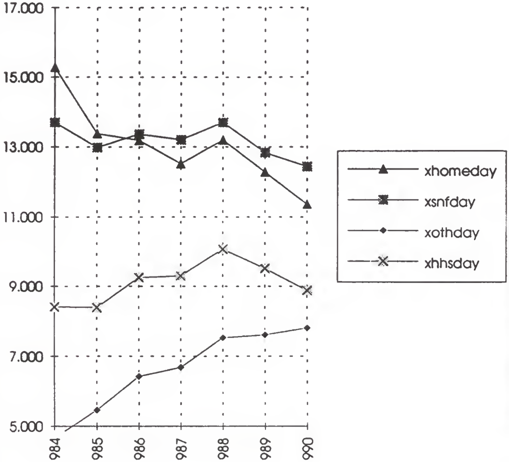
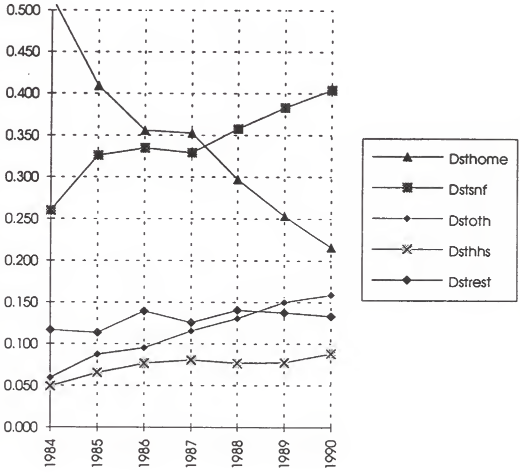


Figure 5. Changes in Average Length of Stay by Destination by Year. (Hospitals With NO Rehab Only)

Changes in Average Length of Stay, by Destination and Year. (Hospitals With NO Rehab Only)					
Year	xhomeday	xsnfday	xothday	xhhsday	xrestday
1984	15.279	13.700	4.663	8.406	13.493
1985	13.383	12.980	5.455	8.388	12.835
1986	13.185	13.366	6.421	9.258	12.719
1987	12.520	13.203	6.680	9.303	12.581
1988	13.190	13.706	7.534	10.066	13.634
1989	12.275	12.834	7.616	9.515	12.931
1990	11.353	12.432	7.811	8.885	11.796

Figure 6. Changes in Proportion of Discharges to Destination by Year. (Hospitals With Rehab Only)



Changes in Proportions Discharged to Destinations by Year.
(Hospitals With Rehab Only)

Year	Dsthome	Dstsnf	Dstoth	Dsthhs	Dstrest
1984	0.515	0.260	0.059	0.049	0.116
1985	0.409	0.326	0.087	0.065	0.113
1986	0.356	0.335	0.095	0.076	0.139
1987	0.353	0.329	0.115	0.080	0.125
1988	0.297	0.358	0.130	0.076	0.140
1989	0.253	0.383	0.150	0.077	0.137
1990	0.216	0.404	0.159	0.088	0.133

mean proportion of discharges to "other" has always been higher than for discharges to home health services. A distinct difference is seen in average length of stay for this group (Figure 7) for "other". Even as this group tends to have a higher mean proportion discharged to the "other" destination, its average length of stay for "other" is considerably higher than for the overall group. Perhaps this is an indication of process differences, where the hospital with rehab units is optimizing both venues of care, acute and rehab, and, thus, is able to optimize reimbursement as well without having to increase acute service provision in the rehab setting.

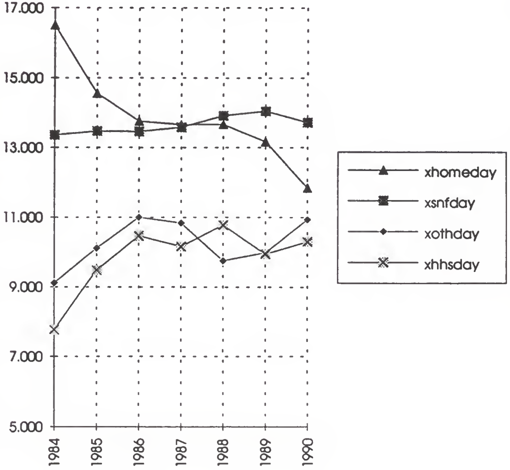
An interesting phenomenon appears in the trends for the group which had rehab in only half the study period (n=594 hospital-years) (Figures 8 and 9). For the first three years, its trends mirror those of the no rehab group and then change in 1987 to reflect those of the rehab group. This change is especially evident in the relationship between the proportions discharged to home health services and "other".

Discharge Destinations and Average Length of Stay

This subsection examines each discharge destination separately, presenting graphic trends and the results of the analysis of variance performed to analyze statistical differences among the study group proportions.

Discharged home. Figure 10 illustrates the 1984-90 trends in proportions of DRG 210 patients discharged home by study group. Analysis of Variance (ANOVA) was used to determine whether statistically significant differences existed among the study groups. The Tukey studentized range test (HSD) was used to make multiple comparisons. The tables included with the figures indicate a * where ANOVA alone found a difference. Differences found by the Tukey test are indicated by alpha groupings. No statistically significant differences among the groups are seen by year in the proportions, but all three groups show a rapidly declining proportion of DRG 210 patients discharged to this destination over time. The trends for the mean average length of

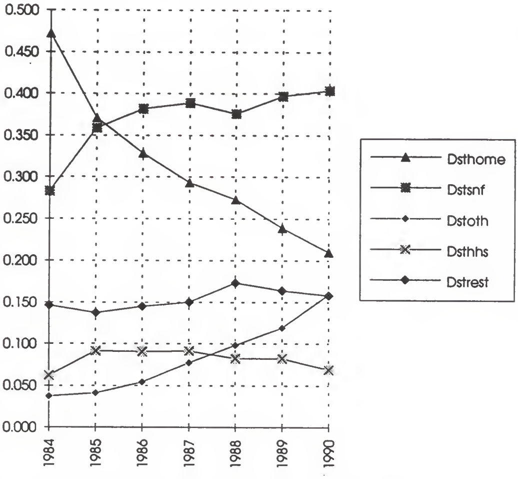
Figure 7. Changes in Average Length of Stay by Destination by Year. (Hospitals With Rehab Only)



Changes in Average Length of Stay, by Destination and Year.
(Hospitals With Rehab Only)

Year	xhomeday	xsnfday	xothday	xhhsday	xrestday
1984	16.505	13.361	9.118	7.779	15.252
1985	14.555	13.472	10.115	9.483	14.661
1986	13.758	13.461	11.000	10.470	12.939
1987	13.659	13.582	10.828	10.160	13.417
1988	13.666	13.920	9.751	10.774	14.318
1989	13.169	14.047	9.990	9.953	14.088
1990	11.844	13.725	10.933	10.297	12.578

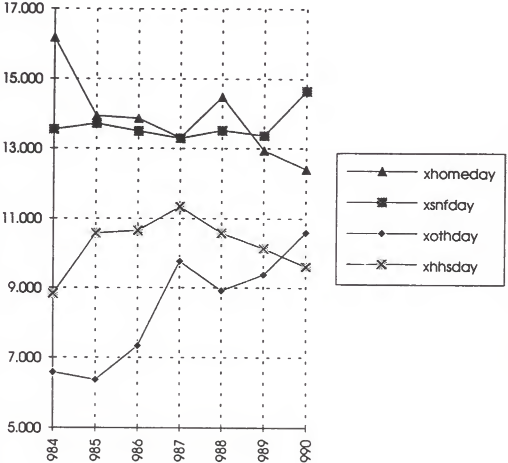
**Figure 8. Changes in Proportion of Discharges to Destination by Year.
(Hospitals Starting Rehab in 86-87 Only)**



Changes in Proportions Discharged to Destinations by Year.
(Hospitals Starting Rehab in 86-87 Only)

Year	Dsthome	Dstsnf	Dstoth	Dsthhs	Dstrest
1984	0.472	0.283	0.037	0.062	0.146
1985	0.371	0.359	0.041	0.091	0.137
1986	0.329	0.382	0.054	0.090	0.145
1987	0.293	0.389	0.077	0.091	0.150
1988	0.273	0.376	0.098	0.082	0.173
1989	0.239	0.397	0.119	0.082	0.164
1990	0.210	0.404	0.159	0.069	0.158

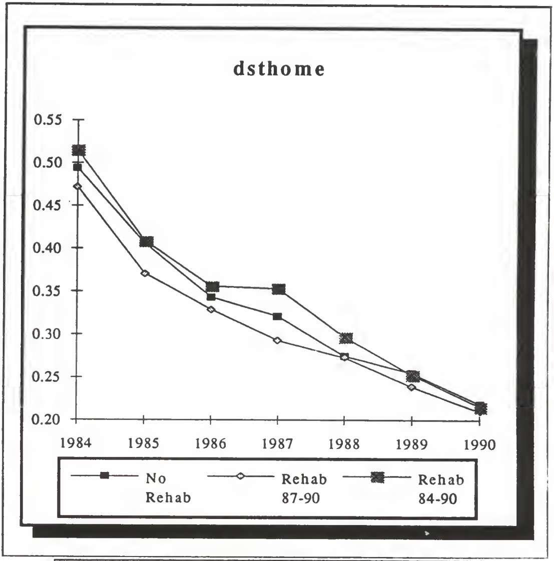
Figure 9. Changes in Average Length of Stay by Destination by Year. (Hospitals Starting Rehab in 86-87 Only)



Changes in Average Length of Stay, by Destination and Year.
(Hospitals Starting Rehab in 86-87 Only)

Year	xhomeday	xsnfday	xothday	xhhsday	xrestday
1984	16.169	13.538	6.579	8.824	14.192
1985	13.933	13.711	6.360	10.580	13.130
1986	13.855	13.488	7.332	10.653	14.772
1987	13.296	13.282	9.771	11.334	13.687
1988	14.483	13.510	8.922	10.579	12.914
1989	12.930	13.357	9.386	10.141	12.201
1990	12.398	14.648	10.597	9.622	13.508

Figure 10. Trend in Proportion of DRG 210 Patients Discharged Home.



Proportion of DRG 210 Patients Discharged Home (dsthome).

Group=	A	B	C	Total Study	Equal Groups
YEAR	No Rehab	Rehab 87-90	Rehab	Sample	alpha=.05*
1984	0.49	0.47	0.52	0.50	ABC
1985	0.41	0.37	0.41	0.40	ABC
1986	0.34	0.33	0.36	0.34	ABC
1987	0.32	0.29	0.35	0.32	ABC
1988	0.28	0.27	0.30	0.28	ABC
1989	0.26	0.24	0.25	0.25	ABC
1990	0.22	0.21	0.22	0.22	ABC

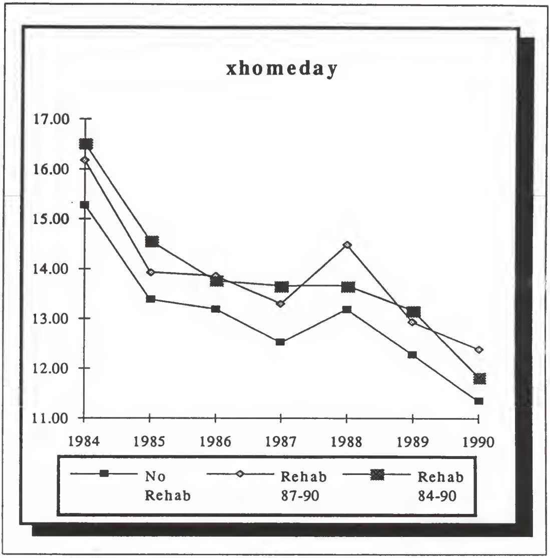
*=ANOVA indicates groups different at the 0.05 level but Tukey does not.

stay present a different picture as seen in Figure 11. A difference in mean length of stay is seen in 1984 with the rehab group having the longest mean average length of stay of 16.51 days. All three groups show a sharp downward trend between 1984 and 1985, although the length of stay for those in the rehab group still remains longer than those in the no rehab group. The mean length of stay is the same for all the groups in 1986, but a difference is seen in 1987 where, once again, those in the rehab group have a longer mean average length of stay than those in the no rehab group. A different pattern is seen in 1988 when the rehab87 group mean rises above the rehab group mean. In 1988, all three groups' mean average lengths of stay increased, relative to the previous years. Only a 0.01% increase is seen for the rehab group, while the no rehab and the rehab87 groups each exhibited much larger increases. The rehab87 group increased over an entire day in mean average length of stay and the no rehab group increased just over half a day. All three groups' mean average lengths of stay continued to decline in the following two years. No difference in length of stay is seen among the groups in the last two study years.

These patterns are interesting in that they may be denoting differences in processes among the study group hospitals as well as reflecting differences in case mix. The relatively flat trend seen in 1986-1988 for the rehab group may indicate these hospitals are those with a relatively higher case mix so that the change in DRG 210 definition did not change their length of stay to the extent seen in the other groups because their processes were already in place to deal with potentially higher numbers of patients with complications and comorbidities.

Discharged to a skilled nursing facility. Figure 12 indicates the mean proportions discharged to a skilled nursing facility demonstrate an opposing trend to that of discharged home. The trend line for all three groups exhibits a steadily increasing slope in this category. No statistically significant differences are seen among the groups in the mean proportion of discharges in 1984-86. A difference in percentage discharges among the groups in 1987 is found where the rehab group discharges a lower proportion than does the rehab87 group, although no difference

Figure 11. Trend in Mean Average Length of Stay (ALOS) for those Discharged Home.

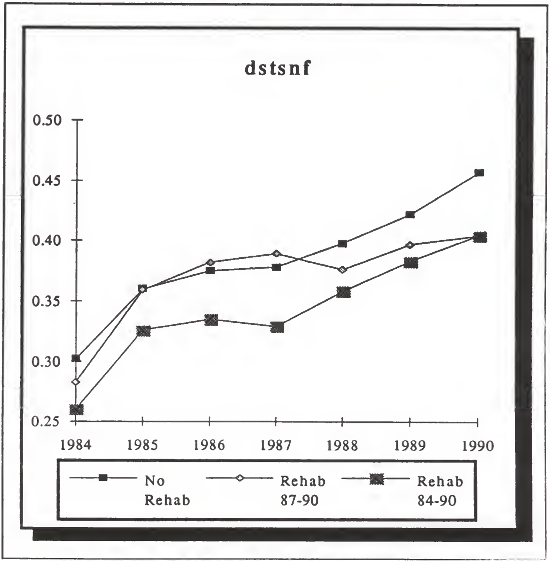


Mean ALOS for those Discharged Home (xhomeday).

Group=	A	B	C	Total Study	Equal Groups
YEAR	No Rehab	Rehab 87-90	Rehab	Sample	alpha=.05*
1984	15.28	16.17	16.51	15.54	ABC*
1985	13.38	13.93	14.56	13.60	AB, BC
1986	13.19	13.86	13.76	13.32	ABC
1987	12.52	13.30	13.66	12.74	AB,BC
1988	13.19	14.48	13.67	13.38	ABC*
1989	12.28	12.93	13.17	12.46	ABC
1990	11.35	12.40	11.84	11.51	ABC

*=ANOVA indicates groups different at the 0.05 level but Tukey does not.

Figure 12. Trend in Proportion of DRG 210 Patients Discharged to a Skilled Nursing Facility (SNF).



Proportion of DRG 210 Patients Discharged to a SNF (dstsnf).

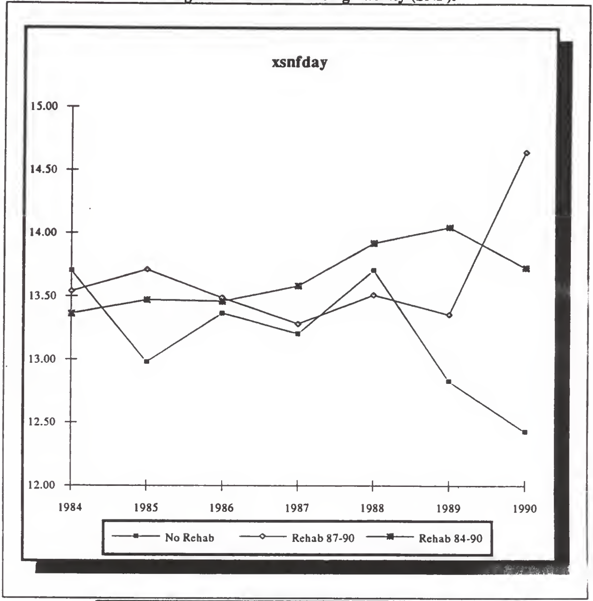
Group=	A	B	C	Total Study Sample	Equal Groups alpha=.05*
YEAR	No Rehab	Rehab 87-90	Rehab		
1984	0.30	0.28	0.26	0.29	ABC
1985	0.36	0.36	0.33	0.36	ABC
1986	0.38	0.38	0.34	0.37	ABC
1987	0.38	0.39	0.33	0.37	AC, BC
1988	0.40	0.38	0.36	0.39	ABC
1989	0.42	0.40	0.38	0.41	ABC
1990	0.46	0.40	0.40	0.45	ABC*

*=ANOVA indicates groups different at the 0.05 level but Tukey does not.

was found between the rehab and the no rehab group. The rehab87 group's trend line shows a dip in 1988 while the rehab group's line dips a year earlier, 1987. The no rehab group's line shows a continual increase over time with a slope that parallels the rehab group's in the last four years. A significant difference is found among the groups in 1990 when both the rehab and rehab87 groups discharged only 40% of their patients to an SNF, but the no rehab group discharged almost half (46%) its hip fracture patients to an SNF. Figure 13 shows the trends in mean average length of stay for those discharged to a skilled nursing facility. Although the plots for the trends do not show corresponding trends, they do present an interesting picture. Rehab group hospitals show an increasing mean average length of stay over time even as the percentage discharged to this destination is increasing. In 1984, the mean proportion discharged to an SNF was .26 for rehab hospitals with a mean average length of stay of 13.36 for this group. In 1987 (the last year before the definition changed), the mean proportion discharged to an SNF was .33 with a corresponding increase in mean average length of stay (13.58), and in 1990, the mean proportion discharged was .40 and the mean average length of stay was 13.73. The increase in mean average length between the last two years could be explained by the change in definition, but this does not account for the increase between 1984 and 1987. One explanation could be that a difference in case mix may be a causal factor where the higher percentages of larger teaching hospitals in the rehab group may be dealing with a higher case mix.

Discharged to "other". Statistically significant differences among the study groups in the average proportions discharged to the "other" destination are seen in all study years as found in Figure 14. This is the only discharge destination in which this pattern is found. As expected, hospitals with rehab units consistently had the highest average proportion discharged to this destination in all study years until 1990 when hospitals who created units in 1986-87 discharged the same average proportion (.16). Of particular interest here is the behavior of the hospitals with units created in 1986-87. Their trend in the average proportion discharged to this destination is similar to the hospitals without rehab units through 1987. However, in 1988-1990 their trend in

Figure 13. Trend in Mean Average Length of Stay (ALOS) for those Discharged to a Skilled Nursing Facility (SNF).

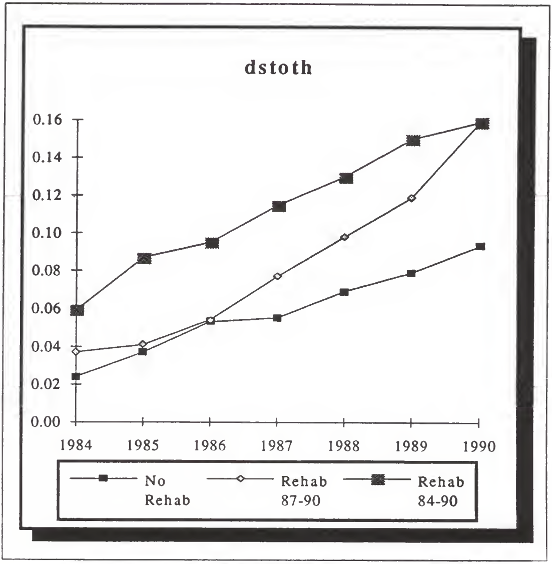


Mean ALOS for those Discharged to a SNF (xsnfday).

Group=	A	B	C	Total Study Sample	Equal Groups alpha=.05*
YEAR	No Rehab	Rehab 87-90	Rehab		
1984	13.70	13.54	13.36	13.64	ABC
1985	12.98	13.71	13.47	13.11	ABC
1986	13.37	13.49	13.46	13.39	ABC
1987	13.20	13.28	13.58	13.26	ABC
1988	13.71	13.51	13.92	13.72	ABC
1989	12.83	13.36	14.05	13.06	ABC*
1990	12.43	14.65	13.73	12.80	AC, BC

*=ANOVA indicates groups different at the 0.05 level but Tukey does not.

Figure 14. Trend in Proportion of DRG 210 Patients Discharged to "Other" (Includes Rehab).



Proportion of DRG 210 Patients Discharged "Other" (dstoth).

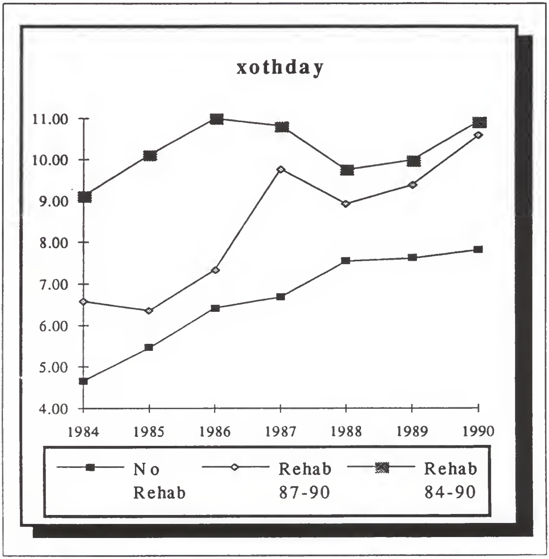
Group=	A	B	C		
YEAR	No Rehab	Rehab 87-90	Rehab	Total Study Sample	Equal Groups alpha=.05*
1984	0.02	0.04	0.06	0.03	AB, BC
1985	0.04	0.04	0.09	0.05	AB, C
1986	0.05	0.05	0.10	0.06	AB, C
1987	0.06	0.08	0.12	0.07	AB, C
1988	0.07	0.10	0.13	0.08	AB, BC
1989	0.08	0.12	0.15	0.09	A, BC
1990	0.09	0.16	0.16	0.11	A, BC

*=ANOVA indicates groups different at the 0.05 level but Tukey does not.

average proportions discharged becomes more and more similar to hospitals with rehab units throughout the study period. Differences among the groups in average length of stay are seen in Figure 15. Interestingly, again the trends follow the same pattern as discussed above. The trend for the group which created units in 1986-87 is similar to the no rehab group until after the change and then their pattern parallels the group with rehab units in all study years, reflecting process changes. It may be hypothesized that hospitals that acquire the technology associated with rehab units appear to also adapt similar operational processes, as indicated by this change to similar discharge patterns with those that had rehab units throughout the study.

Discharged to home health services. Figures 16 and 17 show the trends for discharge to home health services and the average lengths of stay for those discharged to home health services. No statistically significant differences were found among the study groups in the average proportions discharged to home health services in any of the study years. However, it is interesting to note that it is to this discharge destination, in addition to discharge to a skilled nursing facility, that the average proportions discharged by the hospitals in the no rehab group trend above the hospitals with rehab in all study years (with the exception of 1990 for discharge to home health services). Only a five percent increase in discharge to this destination is found during the study period. In only one year, 1985, was a significant difference found in average lengths of stay among the groups. Although not statistically different, the trend lines for average length of stay indicate that, after 1984, hospitals without rehab units in all study years kept their patients a shorter length of time, on average, before discharging them to home health services than did the other two groups.

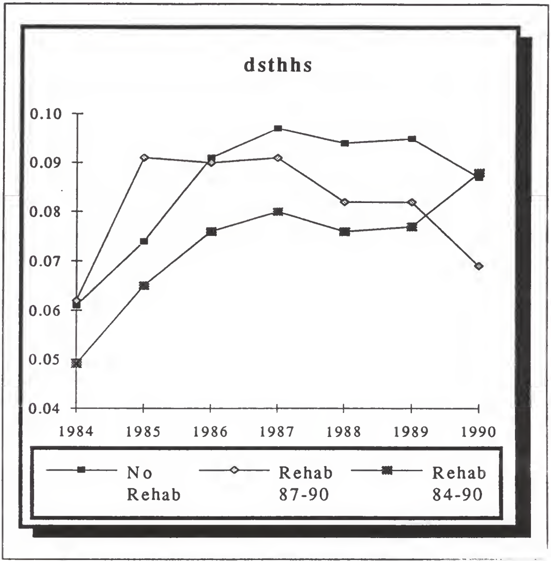
Figure 15. Trend in Mean Average Length of Stay (ALOS) for those Discharged to "Other" (Includes Rehab).



Mean ALOS for those Discharged to "Other" (xothday).					
Group=	A	B	C	Total Study	Equal Groups
YEAR	No Rehab	Rehab 87-90	Rehab	Sample	alpha=.05*
1984	4.66	6.58	9.12	5.50	AB, BC
1985	5.46	6.36	10.12	6.21	AB, C
1986	6.42	7.33	11.00	7.16	AB, C
1987	6.68	9.77	10.83	7.51	A, BC
1988	7.53	8.92	9.75	8.00	ABC*
1989	7.62	9.39	9.99	8.12	ABC*
1990	7.81	10.60	10.93	8.48	A, BC

*=ANOVA indicates groups different at the 0.05 level but Tukey does not.

Figure 16. Trend in Proportion of DRG 210 Patients Discharged to Home Health Services (HHS).

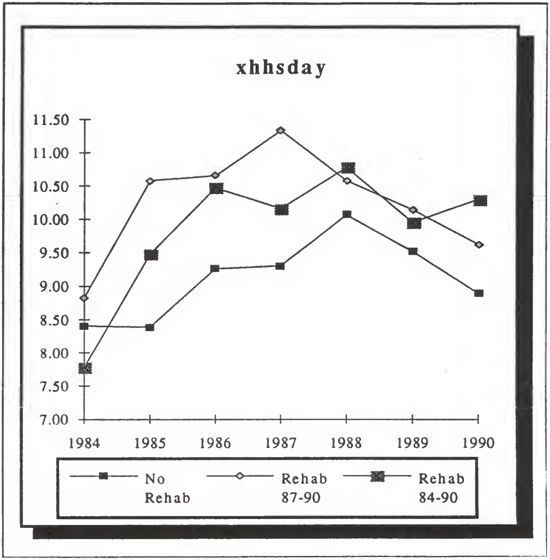


Proportion of DRG 210 Patients Discharged HHS (dsthhs).

Group=	A	B	C	Total Study Sample	Equal Groups alpha=.05*
YEAR	No Rehab	Rehab 87-90	Rehab		
1984	0.06	0.06	0.05	0.06	ABC
1985	0.07	0.09	0.07	0.07	ABC
1986	0.09	0.09	0.08	0.09	ABC
1987	0.10	0.09	0.08	0.09	ABC
1988	0.09	0.08	0.08	0.09	ABC
1989	0.10	0.08	0.08	0.09	ABC
1990	0.09	0.07	0.09	0.09	ABC

*=ANOVA indicates groups different at the 0.05 level but Tukey does not.

Figure 17. Trend in Mean Average Length of Stay (ALOS) for those Discharged to Home Health Services (hhs).



Mean ALOS for those Discharged to Home Health Services (xhhsday).

Group=	A	B	C	Total Study	Equal Groups
YEAR	No Rehab	Rehab 87-90	Rehab	Sample	alpha=.05*
1984	8.41	8.82	7.78	8.34	ABC
1985	8.39	10.58	9.48	8.71	ABC*
1986	9.26	10.65	10.47	9.54	ABC
1987	9.30	11.33	10.16	9.58	ABC
1988	10.07	10.58	10.77	10.22	ABC
1989	9.52	10.14	9.95	9.63	ABC
1990	8.89	9.62	10.30	9.15	ABC

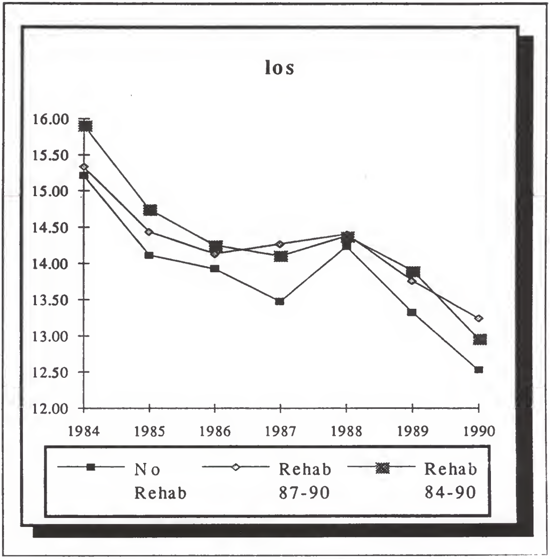
*=ANOVA indicates groups different at the 0.05 level but Tukey does not.

Overall average length of stay, by study group. Figure 18 depicts the overall average length of stay for hip fracture patients in each of the study group hospitals. Only in 1987 is a statistically significant difference found among the study groups. However, the trend lines indicate that the mean average length of stay for those in hospitals without rehab units was always below the other two groups and that the other two groups appeared to have more similar trends in mean average length of stay.

Deflated total charges. Figure 19 illustrates trends in deflated total charges for the three study groups over the study time frame. Although the differences are not always statistically significant, it appears that hospitals with rehab units consistently showed higher deflated total charges, with the other two groups remaining more similar in terms of charges until 1990. At this point, the charges for hospitals that implemented units in 1986-87 appear to be more like the hospitals with rehab units throughout the entire study period.

Appendix D contains the trends for the remaining discharge destinations, discharged to another short-term hospital, to an intermediate care facility, against medical advice, or died, in aggregate.

Figure 18. Trend in Mean Average Length of Stay (ALOS) for those Discharged to All Destinations.



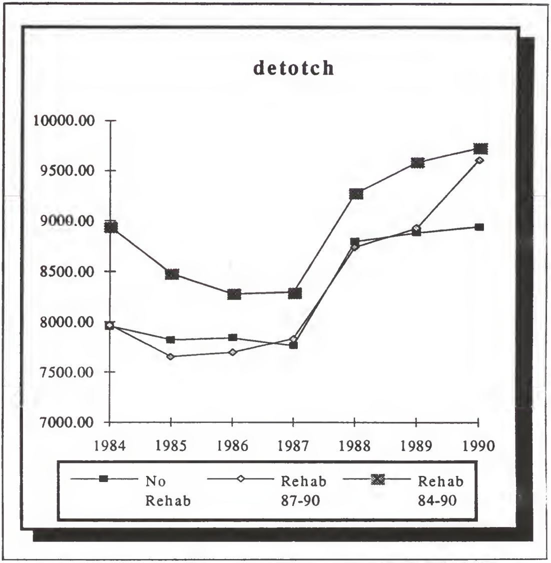
Mean ALOS for those Discharged to All Destinations (los).

Group=	A	B	C	Total Study	Equal Groups
YEAR	No Rehab	Rehab 87-90	Rehab	Sample	alpha=.05*
1984	15.21	15.33	15.91	15.32	ABC
1985	14.12	14.44	14.74	14.23	ABC
1986	13.93	14.13	14.25	13.99	ABC
1987	13.47	14.27	14.11	13.62	ABC*
1988	14.23	14.41	14.38	14.27	ABC
1989	13.33	13.76	13.90	13.45	ABC
1990	12.53	13.25	12.96	12.65	ABC

*=ANOVA indicates groups different at the 0.05 level but Tukey does not.

-17.6%, 13.6 18.5%, -17.4

Figure 19. Trend in Deflated Total Charges for DRG 210 Patients.



Deflated Total Charges for DRG 210 Patients (detotch).

Group=	A	B	C	Total Study Sample	Equal Groups alpha=.05*
YEAR	No Rehab	Rehab 87-90	Rehab		
1984	7956.62	7968.84	8939.57	8108.63	AB, C
1985	7821.47	7654.74	8478.27	7905.64	AB, AC
1986	7836.32	7694.27	8275.88	7889.89	ABC
1987	7761.81	7833.51	8294.60	7843.13	ABC
1988	8792.12	8736.23	9270.62	8860.55	ABC
1989	8879.54	8922.37	9584.33	8988.80	ABC*
1990	8941.46	9612.31	9733.16	9109.04	ABC*

*=ANOVA indicates groups different at the 0.05 level but Tukey does not.

Regression Analysis

A pooled, cross-sectional regression analysis was performed in order to examine the relationship between different discharge destinations. The residuals from the regressions were used as measures of the probability of being discharged to different settings and the intensity of use of the acute care hospital, after controlling for the effects of other factors included in the regression models. Analysis of the correlations between residuals was then undertaken in order to establish whether or not other types of care were substituting for acute care services. Substitution was determined to be taking place if a negative correlation was found between the residuals from the regressions of the discharge destinations. A complementary relationship was determined to exist if a positive correlation was found between two discharge destinations. Therefore, substitution of another discharge destination for acute care services was determined to be taking place if a negative relationship existed between discharged home and another discharge destination. The rationale for this determination was that patients, a large proportion of whom had been discharged home in previous years after a stay in the acute care setting, obtaining all of their care in this setting, are increasingly being transferred to other settings, rather than home. In essence, then, the care in these other settings is substituting for some part of the care that used to take place in the acute setting.

The Regression Model

The regression models were specified utilizing as the dependent variable each of the discharge destinations: percent discharged home, percent discharged to a skilled nursing facility, percent discharged to home health services, percent discharged to "other," and percent discharged to rest--which included, in aggregate, the discharges to other short-term hospitals, to intermediate nursing facilities, those that left against medical advice, and those that died. Similar models were specified for acute hospital services that utilized deflated total hospital charges and average length of stay as the dependent variables.

Input, structure, process, output, and environmental variables were used in all models as the independent variables. A natural log transformation, described above, was performed on all variables except for dummy variables, the year indicator, and the DRG outlier and relative weight indicators. Detailed regression results are contained in Appendices E-H.

Only years in which the hospital reported more than 15 discharged cases of DRG 210 were utilized in this analysis. Further, since the focus of this analysis was to determine whether hospitals had changed their discharge patterns for this DRG, by increasing the use of rehabilitation units, only years in which the hospital actually discharged hip fracture patients to these units were included in the regression analyses. This accomplished two things: 1) it increased the probability that only hospitals with access to this particular discharge destination were included, and, 2) it allowed more clear observation of changes in hospital discharge patterns. This was achieved by using the following final inclusion criterion: the percentage discharged to "other" to be greater than 0 for a hospital-year observation. In addition, only hospital-years where DRG 210 patients were also discharged home and to an SNF were included to alleviate censored data problems. (Examination of these variables indicated relatively normal distributions when the hospitals did discharge patients to these destinations. Problems arose in the analysis because of the sizable number of hospital-years in which the hospital did not discharge a patient to one of these destinations resulting in the variables becoming more binary predictors of outcomes rather than continuous variables. By reducing the study to those hospitals that did discharge patients to these destinations, the mix of discharge destinations could be emphasized rather than the existence of a discharge to a particular destination.)

These limitations resulted in a study sample of only 3428 hospital-years for this analysis. These observations included hospitals with rehab units in all study years (n=708), hospitals that created rehab units in 1986-87 (n=316), and hospitals without rehab units in all of the study years (n=2404). The results from the regression analysis containing the entire study sample indicated that differences existed among the three study groups. Therefore, the sub-sample analyses by study group (had a rehab unit in all years, never had a rehab unit, developed a rehab unit in 1986/87) were performed to examine the patterns of relationships by study group. Collinearity diagnostics were conducted for each of the regression models for the entire study sample and for each of the study sub-samples. Collinearity was not detected between the independent variables in any of the models.

Correlation between Residuals

This subsection examines the results of the correlations between residuals from the regression analyses which were used to determine whether the different discharge destinations substitute for each other or for acute hospital services. Residual analysis was performed to analyze the relationships between the discharge destinations after controlling for the effects of other variables in the regression analysis. Because the correlations among the residuals are the primary foci of this analysis, the following presentation is limited to a discussion of the results of their analysis.

Analysis of Correlations between Residuals--Total Sample Results

This section reports the results for the analysis of residuals for the entire study sample. First, the relationships between discharge destinations are discussed. Second, the relationships between acute services use and discharge destinations are discussed. Table 3 contains the correlations between residuals from the regression analyses which included the total study sample. The residuals from the regressions using the discharge destinations as the dependent variable are labeled RHOME, RSNF, RHHS, ROTH ("other"), and RREST. The residuals from the regressions using deflated total hospital charges and average length of stay as the dependent variables are label RCHG and RLOS, respectively.

Table 3
Correlations between Residuals from Regressions for Discharge Destinations, Total Charges, and Average Length of Stay
All Hospitals
Only Hospital/Years with Percent Discharged to Other, SNF, and Home Greater Than 0
(N=3428)

PEARSON CORRELATION COEFFICIENTS

	RHOME	RSNF	RHHS	ROTH	RREST	RCHG	RLOS
RHOME	1.0000						
RESIDUALS	0.0000						
RSNF	-0.3503	1.0000					
RESIDUALS	0.0001	0.0000					
RHHS	-0.4631	0.0658	1.0000				
RESIDUALS	0.0001	0.0001	0.0000				
ROTH	-0.2097	-0.3271	-0.0662	1.0000			
RESIDUALS	0.0001	0.0001	0.0001	0.0000			
RREST	-0.0983	-0.4053	-0.0061	-0.0925	1.0000		
RESIDUALS	0.0001	0.0001	0.7206	0.0001	0.0000		
RCHG	-0.0721	0.0742	0.0156	-0.0224	0.0106	1.0000	
RESIDUALS	0.0001	0.0001	0.3600	0.1901	0.5371	0.0000	
RLOS	-0.1494	0.1505	0.0399	0.0190	-0.0401	0.5393	1.0000
RESIDUALS	0.0001	0.0001	0.0196	0.2663	0.0190	0.0001	0.0000

Pearson Correlation Coefficients
Probability> |R| UNDER H0:RHO=0

Discharge to home and other destinations. As stated above, a negative correlation between the residuals for two discharge destinations was assumed to indicate a substitution of one destination for another. A substitution effect is noted throughout the first column between discharged home and each of the other discharge destinations. In particular, the -0.4631 correlation coefficient between discharged home and discharged to home health services is the largest in magnitude in terms of substitution between destinations. This finding could be expected as those previously discharged home without additional care could now be discharged earlier to home health services. The correlation between discharged home and discharged to a skilled nursing facility is significant, large, and negative (-.3503). The third largest substitution (-.2097) for discharge to home is discharge to "other" (ROTH), which includes rehab units.

Use of acute services and discharge to home. Negative correlations are found between the residuals from the regressions for both deflated total hospital charges and discharged home and average length of stay and discharged home. These negative associations indicate an inverse relationship between acute hospital service use and being discharged home. That is, more intense acute care stays, as measured by average length of stay and deflated total charges, are associated with lower proportions of hip fracture patients discharged home.

Use of acute services and discharge to a skilled nursing facility. A complementary relationship is suggested between the use of acute services and the subsequent use of skilled nursing facility services. Longer lengths of stay and higher charges are both positively related to discharge to a skilled nursing facility.

Use of acute services and discharge to home health services. No relationship is found between discharge to home health services and total deflated charges. A significant, positive relationship is found between use of acute hospital services, in terms of average length of stay, and discharge to home health services. However, this correlation is very low (.0399). Thus, although a complementary relationship is indicated, it is very weak.

Use of acute services and discharge to "other" (includes rehabilitation units). No relationship is found between discharge to acute services and discharge to "other", the destination that includes rehabilitation units.

Analysis of Correlations among Residuals--Sub-Sample Results

This section reports the findings from the sub-group analyses. Only the findings from the no rehab unit group and the rehab unit group are reported. The sample size for the group which created units in 1986/87 was very small (n=316) for the entire study period after the deletion of hospital/years that did not have a percentage discharged to "other", SNF, and home greater than zero. (Results from this analysis are contained in Appendix I for comparison purposes.)

No Rehab Unit Group

Table 4 contains the correlations between the residuals for the sub-group which had no rehab units in all study years. As in the trend analysis, the results for this group mirror the findings for the entire study sample as this is the largest (n=2404) of the sub-samples analyzed. The direction and significance of the relationships are the same and the magnitude of correlations are very similar.

Table 4
Correlations between Residuals from Regressions for Discharge Destinations, Total Charges, and Average Length of Stay
Hospitals with No Rehab Units Only
Only Hospital/Years with Percent Discharged to Other, SNF, and Home Greater Than 0
(N=2404)

PEARSON CORRELATION COEFFICIENTS

	RHOME	RSNF	RHHS	ROTH	RREST	RCHG	RLOS
RHOME	1.0000						
RESIDUALS	0.0000						
RSNF	-0.3835	1.0000					
RESIDUALS	0.0001	0.0000					
RHHS	-0.4630	0.0550	1.0000				
RESIDUALS	0.0001	0.0070	0.0000				
ROTH	-0.1829	-0.3023	-0.0768	1.0000			
RESIDUALS	0.0001	0.0001	0.0002	0.0000			
RREST	-0.0974	-0.4094	-0.0066	-0.1006	1.0000		
RESIDUALS	0.0001	0.0001	0.7473	0.0001	0.0000		
RCHG	-0.0767	0.0512	0.0139	-0.0055	0.0274	1.0000	
RESIDUALS	0.0002	0.0120	0.4952	0.7895	0.1792	0.0000	
RLOS	-0.1443	0.1587	0.0292	0.0232	-0.0470	0.5244	1.0000
RESIDUALS	0.0001	0.0001	0.1523	0.2561	0.0212	0.0001	0.0000

Pearson Correlation Coefficients
Probability> |R| UNDER H0:RHO=0

Rehab Unit Group

This section presents the results for the comparison group which consisted of hospitals with rehab units in all study years. Table 5 contains the correlations between residuals for this group.

Substitution between destinations. As in the entire sample, the highest substitution for discharge to home is by discharge to home health services. However, the remaining results for the group which had rehab units in all study years are very different from that of the entire study sample. The second highest correlation coefficient, -.3067, is between discharge to home and discharge to "other", in contrast to the correlation coefficient of -.2097 between these destinations in the entire sample and -.1829 for the no rehab group. The other major contrast is in the relationship between discharge to home and discharge to a skilled nursing facility. Here, the relationship is -.2790 for the rehab group in comparison to -.3503 for the entire sample and -.3835 for the no rehab group. Comparing these relationships, different trends for the two subgroups emerge. Those with no rehab units tend to substitute SNF care more for discharge to home while those with rehab units tend to substitute "other" for discharge to home, in effect substituting these sites for acute care services.

Use of acute care services and discharge destinations. In contrast to the findings for the entire sample and the no rehab group, no significant relationship was found between discharge home and either total deflated charges or mean length of stay in the acute setting for the rehab group. However, discharge to "other" did appear to substitute for acute care services for this group, as significant, negative relationships are found between this destination and total deflated charges and mean length of stay in the acute setting.

Table 5
Correlations between Residuals from Regressions for Discharge Destinations, Total Charges, and Average Length of Stay
Hospitals with Rehab Units Only
Only Hospital/Years with Percent Discharged to Other, SNF, and Home Greater Than 0
(N=708)

PEARSON CORRELATION COEFFICIENTS

	RHOME	RSNF	RHHS	ROTH	RREST	RCHG	RLOS
RHOME	1.0000						
RESIDUALS	0.0000						
RSNF	-0.2790	1.0000					
RESIDUALS	0.0001	0.0000					
RHHS	-0.4905	0.1231	1.0000				
RESIDUALS	0.0001	0.0010	0.0000				
ROTH	-0.3067	-0.4181	-0.0229	1.0000			
RESIDUALS	0.0001	0.0001	0.5438	0.0000			
RREST	-0.0660	-0.3746	-0.0427	-0.0457	1.0000		
RESIDUALS	0.0791	0.0001	0.2568	0.2248	0.0000		
RCHG	-0.0564	0.1072	0.0198	-0.0862	0.0064	1.0000	
RESIDUALS	0.1341	0.0043	0.5981	0.0219	0.8648	0.0000	
RLOS	-0.0733	0.1097	0.0365	-0.0757	-0.0045	0.5872	1.0000
RESIDUALS	0.0512	0.0035	0.3317	0.0441	0.9053	0.0001	0.0000

Pearson Correlation Coefficients
Probability> |R| UNDER H0:RHO=0

SUMMARY

This study examined whether care in subacute settings is being substituted for that in the acute care setting for patients with hip fracture. The primary proposition of the study was that rehabilitation services and acute care hospital services are inversely related. The primary measure of rehabilitation services use was by the discharge destination of "other." Two hypotheses related to this proposition were tested. The first stated that the average proportion of patients discharged to "other" is inversely related to the average length of stay in the acute care hospital. The second stated that the average proportion discharged to "other" is inversely related to the average deflated total inpatient charge. Although trend analysis supported these hypotheses, when systematic changes in severity and in the environment were controlled for, these hypotheses were not supported in a sample that included hospitals with distinct part rehabilitative units throughout the study period, those that never had them during the study period, and those that began rehab units during the study period. However, analysis of the sub-group of hospitals with rehab units in all study years revealed that discharge to "other" appeared to substitute for acute care services for this group. (To reiterate, "other" includes discharges to rehabilitation hospitals, rehabilitation units, and Veteran's Administration hospitals.)

Examination of the relationships between discharge destinations disclosed subsidiary relationships between discharge to home and to other destinations. The strongest substitution for the entire sample was by home health services, followed by skilled nursing facilities, and "other". The results for the subgroup of hospitals with rehab units in all study years indicated that the strongest relationship again was with home health services, but for this group, "other" had the second strongest relationship, followed by skilled nursing facilities.

The relationship between care in the acute setting (as measured by deflated total charges and average length of stay) and care in other rehabilitative settings, home health services and skilled nursing facilities, were also examined. Complementary relationships were found between acute care services and discharge to a skilled nursing facility for both measures of acute care services. Only a weak complementary relationship was found between discharge to home health services and mean average length of stay. Findings for the rehab comparison group indicated complementary relationships between acute care and discharge to skilled nursing facilities, but no relationship was found in this group between the measures of acute hospitals services use and discharge to home health services.

CONCLUSIONS

The widely held perception of Medicare patients being released 'sicker and quicker' in the early years of PPS has had empirical validation in recent years, with evidence to indicate that the PPS has increased the likelihood that a patient will be discharged home in an unstable condition (Kosekoff, Kahn, Rogers, et al., 1990; Rogers, Draper, Kahn, et al., 1990). Reductions in acute length of stay have resulted in increased use of rehabilitation in subacute settings, in effect substituting care in these settings for that which was previously received in the acute care setting. The concern for the Medicare beneficiary who needs rehabilitative care is that care in all types of subacute settings is not equivalent and that comparable rehabilitative outcomes are not obtained. One implication for the financing of this care is that although the short term costs of acute care and rehab may be lower when rehab care takes place in sites other than the acute setting, rehab hospital or unit, the long term cost may be greater as hip fracture patients may remain in the nursing home on a long term basis, shifting costs from the acute to the long term care sector.

This longitudinal study of the changes in discharge destinations and hospital utilization of hip fracture patients 70+ years of age with comorbidities (DRG 210) over the period of 1984 through 1990 has found dramatic changes. During that period, the proportion of patients discharged home from the acute urban community hospital has dropped from 49.6 percent in 1984 to 21.8 percent in 1990. Even if one adds that proportion of patients discharged to home health to those discharged home with no further care, the decline in those going back to the home setting is substantial (from 55.5 percent in 1984 to 30.4 percent in 1990). This translates into over a 56% increase of hip fracture patients being transferred into an institution rather than the home setting in a six year period.

It is unquestionable that the changes in the Medicare reimbursement system are a causal agent in this change in treatment patterns. However, questions that remain unanswered include:

> Has this change decreased acute care costs associated with hip fractures?
> More importantly, has the "total" cost associated with a hip fracture episode decreased or increased with this change?
> Most importantly, is the individual patient's outcome from this change of practice better or worse because of this change?

This study has shown that a change has occurred and has provided a baseline to the scope and magnitude of that change in practice. PPS has had an effect and hospitals have responded to the change in their environment, and several different changes have been identified. This study revealed differential patterns of discharge destinations dependent upon the hospital type, i.e. whether or not the hospital had a distinct part rehabilitation unit. Some hospitals have only changed their acute services. Others have added and incorporated into their systems new technologies: the distinct part rehabilitation unit. What now must be determined is whether any or all of these changes are for the better or worse and then change policy based upon that determination.

The average length of stay for this diagnosis related group shows a steady decline over the study years, not just an initial substantial reduction with subsequent stabilization found in other

PPS studies (Coulam & Gaumer, 1991). This finding reinforces the continuing concern with the appropriateness of timing of discharge from the acute into the rehabilitation setting. If, as Morrisey and his colleagues (1988a, p. 687) suggest, hospitals have been "unbundling" services associated with this diagnosis related group, in this case, recovery time, monitored bed rest, and recuperative therapies, it still remains to be seen whether this unbundling is beneficial for the hip fracture patient in terms of the total episode of care for hip fracture.

Limitations

In this research, we are unable to separate the type of rehabilitation units (orthopedic vs. any other type). Therefore, we were not able to completely isolate the effects of having an orthopedic rehabilitation unit for hip fracture patients. In addition, we were not able to examine whether or not the substitutions were inappropriate. That is, we were not able to measure whether patients were being discharged too quickly into the rehabilitation setting. Nor were we able to assess whether the setting to which the patient was discharged was the appropriate one in terms of resources and intensity of services available.

Future Research

In order to completely examine the relationship between rehabilitation services and acute care, it is necessary to improve the measurement of rehabilitative services supply variables and to conduct a macrolevel analysis. In addition, a focus on episodes of care at the patient level of analysis will show more clearly the transitions between acute and rehabilitation services. As previously stated, in order to measure inappropriate substitution of rehabilitation services for hospital services, it appears more appropriate to examine the episode of care for individuals who are not hospitalized with diagnoses whose plan of care would often entail frequent rehospitalizations. An episode of care would then consist of acute admission through rehabilitation discharge either home or to a long-term care setting. Since this analysis was at the organizational level, episodes of care were not analyzed. Rather, it examined discharge destinations aggregated at the hospital level. A study to identify the process differences associated with hospitals with and those without a distinct part rehab unit and the differences between the outcomes from these two settings would be enlightening.

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Appendix A

Eligibility Criteria and Medicare Reimbursement

Appendix A

Eligibility Criteria for the Medicare Home Health Agency Benefit

Payment for covered services under the Medicare Home Health Agency Benefit is made only if all the following conditions are met (Helbing, Sangl, & Silverman, 1992, p. 125):

1. The beneficiary must be confined to the home. This does not mean that the beneficiary must be bedridden, however, his or her condition should be such that to leave home would require a considerable effort.
2. The services provided under a plan of care established and periodically reviewed by a physician who reviews and signs it no less frequently than every 2 months.
3. The beneficiary is under the care of a physician who signs the physician certification.
4. The beneficiary needs intermittent skilled nursing care, physical therapy, or speech therapy. If these services are required, occupational therapy may also be provided.
5. The HHA services are delivered by an agency certified to participate in the Medicare program.

Eligibility Criteria for the SNF Benefit

The following six conditions must be met for Medicare hospital insurance to assist in payment for care in a Medicare-participating skilled nursing facility (Helbing & Cornelius, 1992):

1. The patient's condition requires daily skilled nursing or skilled rehabilitation services that, as a practical matter, can only be provided in an SNF.
2. The beneficiary was in a hospital at least 3 consecutive days before being admitted to a participating SNF.
3. The beneficiary was admitted to an SNF within 30 days after leaving the hospital.
4. The care in the SNF is for a condition that was treated in the hospital or for a condition that arose while the beneficiary was receiving care in the SNF for a condition that was treated in the hospital.
5. A medical professional certifies that the beneficiary needs skilled nursing or skilled rehabilitation services on a daily basis.
6. The Medicare intermediary does not disapprove the stay.

Medicare Reimbursement for Rehabilitation Services

In order for Medicare reimbursement to be received for inpatient rehabilitation services, two conditions must be met (DHHS, 1982 from Hosek, et al., 1986--pp. 4-5):

1. The efficacy, duration, and amount of services rendered must be reasonable and necessary.
2. It must be reasonable and necessary for care to be provided in an inpatient hospital setting, rather than a less care-intensive setting such as a skilled nursing facility or on an outpatient basis.

Inpatient care is determined to be both reasonable and necessary when a rehabilitation patient requires the following services (DHHS, 1982):

1. 24-hour availability of a physician with special training or experience in rehabilitation, and frequent (every two to three days), direct, and medically necessary physician involvement;
2. 24-hour availability of a registered nurse with special training or experience in rehabilitation;
3. At least three hours per day of physical or occupational therapy, in addition to other required therapies or services (speech therapy, social services, psychological services, or prosthetic-orthotic services);
4. Care from a multidisciplinary team, minimally including a physician, rehabilitation nurse, and therapist;
5. A coordinated program of care, including team conferences held at least once every two weeks to determine the appropriateness of continuing care.

Exemption from PPS for Distinct-Part, Rehabilitation Units

In addition to the common requirements for excluded distinct-part units, rehabilitation units must also meet the following requirements (42 CFR 412.29, Revised as of October 1992):

(a) Except as provided in 412.30, have treated, during its most recent 12-month cost reporting period, an inpatient population of which at least 75 percent required intensive rehabilitative services for the treatment of one or more of the conditions listed in 412.23(b)(2) (these conditions include hip fracture).

(b) Have in effect a preadmission screening procedure under which each prospective patient's condition and medical history are reviewed to determine whether the patient is likely to benefit significantly from an intensive inpatient program or assessment.

(c) Ensure that the patients receive close medical supervision and furnish, through the use of qualified personnel, rehabilitation nursing, physical therapy, and occupational therapy as needed, speech therapy, social services or psychological services, and orthotic and prosthetic services.

(d) Have a plan of treatment for each inpatient that is established, reviewed, and revised as needed by a physician in consultation with other professional personnel who provide services to the patient.

(e) Use a coordinated multidisciplinary team approach in the rehabilitation of each inpatient, as documented by periodic clinical entries made in the patient's medical record to note the patient's status in relationship to goal attainment, and that team conferences are held at least every two weeks to determine the appropriateness of treatment.

(f) Have a director of rehabilitation who--
  (1) Provides services to the unit and to its inpatients for at least 20 hours per week;
  (2) Is a doctor of medicine or osteopathy;
  (3) Is licensed under State law to practice medicine or surgery; and
  (4) Has had, after completing a one-year hospital internship, at least two years of training or experience in the medical management of inpatients requiring rehabilitation services.

Appendix B

States by AHA Regions

Appendix B
States by AHA Regions

New England :
- Maine
- New Hampshire
- Vermont
- Massachusetts
- Rhode Island
- Connecticut

Mid-Atlantic:
- New York
- New Jersey
- Pennsylvania

South Atlantic:
- Delaware
- Maryland
- District of Columbia
- Virginia
- West Virginia
- North Carolina
- South Carolina
- Georgia
- Florida

East North Central:
- Ohio
- Indiana
- Illinois
- Michigan
- Wisconsin

East South Central:
- Kentucky
- Tennessee
- Alabama
- Mississippi

West South Central:
- Arkansas
- Louisiana
- Oklahoma
- Texas

Mountain:
- Montana
- Idaho
- Wyoming
- Colorado
- New Mexico
- Arizona
- Utah
- Nevada

Pacific:
- Washington
- Oregon
- California
- Alaska
- Hawaii

West North Central:
- Minnesota
- Iowa
- Missouri
- North Dakota
- South Dakota
- Nebraska
- Kansas

Appendix C

Descriptive Statistics

Appendix C

Descriptive Statististics

Three study years were used to examine the differences between study and non-study hospitals. These comparisons are made between groups which differ on the final exclusionary criterion of number of DRG 210 discharges. Hospitals with 15 or more discharges for DRG 210 in a study year remain in the study sample for that year, hospitals with less than 15 DRG 210 discharges in any study year are excluded. Since hospitals not under the prospective payment system were excluded from the study sample, the 1984 cross-sectional sample had the lowest sample size because of the progressive implementation of PPS. Due to the change in definition of DRG 210 in 1987, comparisons are also made in that study year. Last, comparisons were also made in 1990, the final study year.

1984 Inputs

Table 1 contains the comparison of 1984 (Year 1 of the study time frame) characteristics of the overall study sample with non-study hospitals. Patient characteristics reflect the inputs into the hospital's process for DRG 210. No differences in patient characteristics are found between the two groups. Both study and non-study hospital hip fracture patients' mean age fell in the range of 80-84, with over 60% of patients age 80 and above. Approximately 80% were female in each group. Each group had a mean number of diagnoses of slightly over three.

1984 Throughputs

Statistically significant differences were found on all hospital structural characteristics except the percent with either skilled nursing beds or the percent with a nursing home unit. A much higher percentage of study hospitals were not-for-profit (75.8% vs 47.6% for the non-study group) and also were larger than non-study hospitals, with an average of 302 beds versus

Table 1
Comparison of 1984 Baseline Study Sample (n=833) with Non-study Hospitals (n=300)

Variable	Study Sample	Non-study Hospitals	Significance[1]
INPUTS (Patient Characteristics)			
Age Group Mean	7.0	7.0	
Percent age 80 and over	.65	.61	
Percent female	.80	.78	
Mean number of diagnoses	3.22	3.26	
THROUGHPUTS			
Structure (Hospital Characteristics)			
Percent governmental	13.8	22.3	***
Percent not-for-profit	75.8	47.6	****
Percent for-profit	10.4	30.1	****
Percent with SNF beds	7.2	7.1	
Percent with rehab beds	15.4	2.6	****
Percent with rehab beds in all study years	15.3	2.6	****
Percent with rehab beds starting in 1986/87	7.9	1.6	****
Percent that never had rehab beds	76.7	95.8	****
Percent with a nursing home unit	6.7	7.4	
Mean number of acute care beds	303.0	138.0	****
Percent teaching	12.7	5.8	****
Mean proportion of inpatient days that are DRG 210 inpatient days	0.004	0.003	****

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[1] **** Significant at .01% or .0001, two-tailed test
*** Significant at .1% or .001, two-tailed test
** Significant at 1% or .01, two-tailed test
* Significant at 5% or .05, two-tailed test

Table 1 (continued)
Comparison of 1984 Baseline Study Sample (n=833) with Non-study Hospitals (n=300)

Variable	Study Sample	Non-study Hospitals	Significance[1]
Process			
Mean number of DRG 210 discharges	42.21	7.86	****
Mean number of surgeries per case	1.46	1.44	
Mean number of patients with outpatient charges	31.85	5.06	****
Mean percent of patients with outpatient charges	74.5	62.1	****
Mean outpatient charges (deflated)	$74.74	$51.32	****
Mean number of patients with physical therapy	35.17	6.64	****
Mean percent of patients with physical therapy charges	84.4	83.7	
Mean physical therapy charge (deflated)	$341.24	$335.27	
Average length of stay for DRG 210	15.3	15.3	
Average length of stay by discharge destination:[2]			
Discharged home	15.6	14.1	***
Discharged SNF	13.6	10.4	****
Discharged other (rehab)	5.5	2.4	****
Discharged home health	8.3	3.3	****
Discharged all others	13.8	8.1	****

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[1] **** Significant at .01% or .0001, two-tailed test
*** Significant at .1% or .001, two-tailed test
** Significant at 1% or .01, two-tailed test
* Significant at 5% or .05, two-tailed test

[2] These are the overall organizational average length of stay for individuals discharged for each of these discharge destinations, e.g., the average length of stay for individuals discharged home.

Table 1 (continued)
Comparison of 1984 Baseline Study Sample (n=833) with Non-study Hospitals (n=300)

Variable	Study Sample	Non-study Hospitals	Significance[1]
OUTPUTS			
Percent by discharge destination:			
Discharged home	49.6	52.0	
Discharged SNF	29.4	27.6	
Discharged other (rehab)	3.0	2.7	
Discharged home health	5.9	4.4	*
Discharged all others	12.1	13.3	
Deflated total charges	$8108.63	$8845.76	**
ENVIRONMENT			
Medicare inpatient days as a percent of total inpatient days	44.7	40.7	****
Percent by AHA Region:			
Northeast	3.1	0.97	**
Mid-Atlantic	6.5	4.2	
South Atlantic	19.9	13.3	**
East North Central	24.7	24.3	
East South Central	5.7	6.5	
West North Central	8.6	8.1	
West South Central	11.4	18.4	**
Mountain	3.5	3.6	
Pacific	16.4	20.7	

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[1] **** Significant at .01% or .0001, two-tailed test
*** Significant at .1% or .001, two-tailed test
** Significant at 1% or .01, two-tailed test
* Significant at 5% or .05, two-tailed test

138 for the non-study group. More study hospitals were teaching hospitals and also had a higher proportion of their inpatient days relegated to DRG 210. With respect to the three hospital types of interest in this study, over 15% of the study hospitals had rehab units in all study years compared to only 2.6% of non-study hospitals; 7.9% of study hospitals had rehab units for half the study period compared to 1.6% of non-study hospitals; and, 76.7% of study hospitals fell into the category of not having rehab beds throughout the study time frame in comparison to 95% of non-study hospitals.

1984 Process

The two groups also differed on many process characteristics, as expected. Study hospitals had an average of 42.2 DRG 210 discharges, compared to 7.86 discharges for the non-study group, although no difference was found in the mean number of surgeries per case. Differences were found in the mean number and percent of patients with outpatient charges, as well as mean charge for outpatient services. Although, as expected, the mean number of patients with physical therapy differed, no difference was found between the groups on the percent of patients with physical therapy charges and the same mean physical therapy charge (deflated) was found for patients in each group. There was no difference between the groups in terms of the overall average length of stay for DRG 210. However, statistically significant differences are found between the groups when average length of stay is examined in terms of the categories of discharge destination. Again, the average length of stay by discharge destination is examined since the process for getting to each destination can be considered to be different in terms of resource use as well as having different inputs (e.g., different patient characteristics). Study group hospitals had significantly higher average lengths of stay for each discharge destination.

1984 Outputs

The only significant difference in terms of discharge destination between the two groups was found for the percent of patients discharged to home health services with study hospitals discharging a slightly higher percentage of their patients to this destination (5.9% versus 4.4% for non-study hospitals). No significant differences were found between the two groups on the percentage of patients discharged home, to an SNF, to other (which includes rehab), or to the category that included all other possible destinations. A difference was found on the other major outcome variable, where study hospitals were found to have significantly lower average total charges (deflated) per case.

1984 Environment

The differences between two environmental variables were examined. Study hospitals were found to have a significantly higher dependence on Medicare inpatient days as a percent of total patient days, 44.7% versus 40.7% for non-study hospitals. Regional differences were found in the Northeast, the South Atlantic, and the West South Central regions (see Appendix B for states included in these AHA regions).

1987 Inputs

Table 2 contains the comparisons of 1987 study hospitals with non-study hospitals. In 1987, significant differences were found on age between study and non-study hospitals. A larger percentage of study hospital hip fracture patients were age 80 and over, 64.5% versus 60.6% for non-study hospitals. No significant differences were found for either gender or mean number of diagnoses per case.

1987 Throughputs

Hospital structural characteristics. Significant differences were found on all hospital structural characteristics except the presence of a nursing home unit. About 75% of study hospitals were not-for-profit, with the rest divided almost evenly between governmental or for-profit. Non-study hospitals exhibited a larger split on ownership type, although again the bulk (45.9%) were not-for-profit. A greater percentage of study hospitals had rehab and skilled nursing beds. In comparison to the 78% of study hospitals without rehab beds during the entire study period, over 93% of non-study hospitals fell into this category. A larger proportion of study hospitals were teaching hospitals and had a significantly higher proportion of inpatient days for DRG 210. Again, study hospitals had a significantly higher number of acute care beds.

Process. As expected, study hospitals had a much higher mean number of DRG 210 discharges although the mean number of surgeries per case did not differ between the two groups. The percent of patients with outpatient charges did not differ nor did the mean outpatient charge (deflated). Similarly, no differences were found on the percentage of patients receiving physical therapy, but study hospital patients incurred a slightly higher average charge for physical therapy services (deflated). Study hospital patients had a slightly longer average length of stay with similar, larger differences seen in all categories of discharge destination.

1987 Outputs

Significant differences existed between study and non-study hospitals on two categories of discharge destination. Study hospitals discharged a lower percentage of their patients home (32.4% versus 38.4% for non-study hospitals) but discharged a higher percentage to home health services. Deflated total charges were significantly lower ($7843) for study hospitals than non-study hospitals ($8373).

1987 Environment

Study hospitals had a higher dependence on Medicare inpatient days (45.1%) than non-study hospitals (38.6%). Regional differences were the same as 1984 with the addition of a difference in the Mid-Atlantic region.

Table 2
Comparison of 1987 Study Sample (n=1180) with Non-study Hospitals (n=368)

Variable	Study Sample	Non-study Hospitals	Significance[1]
INPUTS (Patient Characteristics)			
Age Group Mean	7.1	7.0	**
Percent age 80 and over	64.5	60.6	**
Percent female	79.8	78.2	
Mean number of diagnoses	3.7	3.6	
THROUGHPUTS			
Structure (Hospital Characteristics)			
Percent governmental	12.0	24.7	****
Percent not-for-profit	74.7	45.9	****
Percent for-profit	13.3	29.3	****
Percent with SNF beds	13.3	8.7	**
Percent with rehab beds	21.9	6.3	****
Percent with rehab beds in all study years	14.2	3.3	****
Percent with rehab beds starting in 1986/87	7.6	3.0	****
Percent that never had rehab beds	78.1	93.8	****
Percent with a nursing home unit	11.0	8.2	
Mean number of acute care beds	287.00	139.00	****
Percent teaching	12.4	6.3	****
Mean proportion of inpatient days that are DRG 210 inpatient days	0.005	0.003	****

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[1] **** Significant at .01% or .0001, two-tailed test
*** Significant at .1% or .001, two-tailed test
** Significant at 1% or .01, two-tailed test
* Significant at 5% or .05, two-tailed test

Table 2 (continued)
Comparison of 1987 Study Sample (n=1180) with Non-study Hospitals (n=368)

Variable	Study Sample	Non-study Hospitals	Significance[1]
Process			
Mean number of DRG 210 discharges	43.0	7.8	****
Mean number of surgeries per case	1.7	1.6	
Mean number of patients with outpatient charges	7.8	1.3	****
Mean percent of patients with outpatient charges	17.4	15.7	
Mean outpatient charges (deflated)	$27.00	$26.00	
Mean number of patients with physical therapy	38.0	7.0	****
Mean percent of patients with physical therapy charges	89.1	88.1	
Mean physical therapy charge (deflated)	$329.00	$304.00	*
Average length of stay for DRG 210	13.6	13.1	*
Average length of stay by discharge destination:[2]			
Discharged home	12.7	10.1	****
Discharged SNF	13.3	9.6	****
Discharged other (rehab)	7.5	3.3	****
Discharged home health	9.6	3.7	****
Discharged all others	12.8	7.4	****

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[1] **** Significant at .01% or .0001, two-tailed test
*** Significant at .1% or .001, two-tailed test
** Significant at 1% or .01, two-tailed test
* Significant at 5% or .05, two-tailed test

[2] These are the overall organizational average length of stay for individuals discharged for each of these discharge destinations, e.g., the average length of stay for individuals discharged home.

Table 2 (continued)
Comparison of 1987 Baseline Study Sample (n=1180) with Non-study Hospitals (n=368)

Variable		Study Sample	Non-study Hospitals	Significance[1]
OUTPUTS				
Percent by discharge destination:				
	Discharged home	32.4	38.4	***
	Discharged SNF	37.2	34.2	
	Discharged other (rehab)	6.6	6.0	
	Discharged home health	9.4	6.8	**
	Discharged all others	14.6	14.7	
Deflated total charges		$7843.00	$8373.00	*
ENVIRONMENT				
Medicare inpatient days as a percent of total inpatient days		45.1	38.6	****
Percent by AHA Region:				
	Northeast	3.4	1.6	*
	Mid-Atlantic	9.6	6.5	*
	South Atlantic	18.6	13.0	**
	East North Central	21.5	20.7	
	East South Central	7.1	6.0	
	West North Central	7.2	9.2	
	West South Central	11.7	22.0	****
	Mountain	4.1	3.0	
	Pacific	16.7	17.9	

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[1] **** Significant at .01% or .0001, two-tailed test
*** Significant at .1% or .001, two-tailed test
** Significant at 1% or .01, two-tailed test
* Significant at 5% or .05, two-tailed test

1990 Inputs

Table 3 presents the results of the comparisons between the 1990 study sample and non-study hospitals. No differences are noted between the two groups in overall age and percentage age 80 and over. The study sample contained a higher percentage of females. Although the difference between the two groups was not significant, it should be noted that the mean number of diagnoses is higher than in the 1984 and 1987, which can be attributed to the change in DRG 210 definition which was effective in October 1987.

1990 Throughputs

Hospital structural characteristics. Again, no differences existed between study and non-study hospitals on the percentage with SNF beds or a nursing home unit, although the percentage in each category has increased over time for both types of hospitals. Interestingly, in 1990, there is no difference between the two groups in the percentage that are teaching hospitals, although the study hospitals still are larger in number of beds. Differences between the two groups on ownership reflect the pattern seen in 1987. A similar distribution among the categories for the rehab beds is seen in 1990 as in earlier years for the study hospitals. Study hospitals still have a higher proportion of inpatient days in DRG 210 than non-study hospitals.

Process. No differences existed on mean number of surgeries per case. As in 1987, no differences were found between the two groups on the percentage of patients with outpatient charges, however, study group hospitals had higher outpatient charges, $48 versus $21 for non-study hospitals. Again, no differences existed on the percentage of patients with physical therapy or charges for physical therapy. Similar average length of stay for DRG 210 was found in 1990, but differences in average length of stay by discharge destination is seen in all categories of that variable. Study group hospitals' average length of stay is longer in all categories of discharge destination in each year, perhaps reflecting a higher case mix.

Table 3
Comparison of 1990 Study Sample (n=1110) with Non-study Hospitals (n=479)

Variable	Study Sample	Non-study Hospitals	Significance[1]
INPUTS (Patient Characteristics)			
Age group mean	7.12	7.11	
Percent age 80 and over	66.8	65.9	
Percent female	79.0	76.2	**
Mean number of diagnoses	4.5	4.4	
THROUGHPUTS			
Structure (Hospital Characteristics)			
Percent governmental	10.1	23.4	****
Percent not-for-profit	74.5	52.4	****
Percent for-profit	15.3	24.2	****
Percent with SNF beds	20.9	18.4	
Percent with rehab beds	22.4	6.7	****
Percent with rehab beds in all study years	14.1	4.8	****
Percent with rehab beds starting in 1986/87	8.3	1.9	****
Percent that never had rehab beds	77.6	93.3	****
Percent with a nursing home unit	17.5	16.9	
Mean number of acute care beds	289.0	151.0	****
Percent teaching	10.2	9.2	
Mean proportion of inpatient days that are DRG 210 inpatient days	0.004	0.003	****

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[1] **** Significant at .01% or .0001, two-tailed test
*** Significant at .1% or .001, two-tailed test
** Significant at 1% or .01, two-tailed test
* Significant at 5% or .05, two-tailed test

Table 3 (continued)
Comparison of 1990 Study Sample (n=1110) with Non-study Hospitals (n=479)

Variable	Study Sample	Non-study Hospitals	Significance[1]
Process			
Mean number of DRG 210 discharges	40.2	7.7	****
Mean number of surgeries per case	1.7	1.7	
Mean number of patients with outpatient charges	6.8	1.1	****
Mean percent of patients with outpatient charges	16.1	13.7	
Mean outpatient charges (deflated)	$48.00	$21.00	****
Mean number of patients with physical therapy	36.1	6.9	****
Mean percent of patients with physical therapy charges	90.3	89.1	
Mean physical therapy charge (deflated)	$354.00	$333.00	
Average length of stay for DRG 210	12.6	12.7	
Average length of stay by discharge destination:[2]			
Discharged home	11.5	8.7	****
Discharged SNF	12.8	10.2	****
Discharged other (rehab)	8.5	4.1	****
Discharged home health	9.1	4.3	****
Discharged all others	12.1	8.2	****

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[1] **** Significant at .01% or .0001, two-tailed test
*** Significant at .1% or .001, two-tailed test
** Significant at 1% or .01, two-tailed test
* Significant at 5% or .05, two-tailed test

[2] These are the overall organizational average length of stay for individuals discharged for each of these discharge destinations, e.g., the average length of stay for individuals discharged home.

Table 3 (continued)
Comparison of 1990 Baseline Study Sample (n=1110) with Non-study Hospitals (n=479)

Variable		Study Sample	Non-study Hospitals	Significance[1]
OUTPUTS				
Percent by discharge destination:				
	Discharged home	21.8	27.5	****
	Discharged SNF	44.5	41.5	
	Discharged other (rehab)	10.8	8.7	*
	Discharged home health	8.6	7.1	*
	Discharged all others	15.2	14.4	
Deflated total charges		$9109.00	$9679.00	*
ENVIRONMENT				
Medicare inpatient days as a percent of total inpatient days		48.7	41.9	****
Percent by AHA Region:				
	Northeast	3.1	2.3	
	Mid-Atlantic	9.3	6.9	
	South Atlantic	20.1	11.9	****
	East North Central	21.3	20.3	
	East South Central	6.7	7.1	
	West North Central	7.4	8.4	
	West South Central	11.7	19.0	***
	Mountain	4.3	3.5	
	Pacific	16.2	20.7	*

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[1] **** Significant at .01% or .0001, two-tailed test
*** Significant at .1% or .001, two-tailed test
** Significant at 1% or .01, two-tailed test
* Significant at 5% or .05, two-tailed test

1990 Outputs

In the examination of the categories of discharge destination, again, study hospitals discharged a lower percentage home and a slightly higher percentage to home health services. In 1990, study hospitals discharged a higher percentage of patients to rehab than did non-study hospitals. No differences were found on discharges to SNF or all other destinations. Again, study hospitals had lower ($9109) average total charges than did non-study hospitals ($9679).

1990 Environment

As in the previous two years examined, in 1990, study hospitals had a higher dependence on Medicare for inpatient days. Regional differences changed in 1990. Northeast and Mid-Atlantic regions were no longer different. South Atlantic and West South Central regions remained different in percentage of hospitals by these two groups. A significant difference between the study and the non-study group is found in the percentage of each in the Pacific region.

Results from the Analysis of Variance

Analysis of variance was used to compare input, throughput, output, and environmental differences among the four comparison groups. An additional comparison group was included in the ANOVAs, the excluded hospitals with 15 or more discharges who did not fit into one of the three groups (referred to as the excluded group), never had rehab (referred to as the no rehab group), rehab starting in 1986/87 (referred to as the rehab87 group), or rehab in all years (referred to as the rehab group). Again, this descriptive analysis was done for the years 1984, 1987, and 1990.

1984 Inputs--ANOVA Results

Table 4 contains the results of the 1984 ANOVAs of the comparison groups. No differences were found among the groups on any of the patient characteristics.

Table 4
Comparison of 1984 Study Hospitals by Group Code

Variable	No Rehab (n=639)	Rehab87 (n=66)	Rehab (n=128)	Excluded (n=149)	Significance[1]
INPUTS					
(Patient Characteristics)					
Age group mean	7.0	7.0	7.0	7.0	
Percent age 80 and over	63.7	64.0	62.4	63.1	
Percent female	79.9	80.5	78.9	79.6	
Mean number of diagnoses	3.2	3.2	3.3	3.2	
THROUGHPUTS					
Structure					
(Hospital Characteristics)					
Percent governmental	15.2	10.6	8.6	10.7	
Percent not-for-profit	72.1^{b}	$84.8^{a,b}$	89.1^{a}	$81.2^{a,b}$	****
Percent for-profit	12.7^{a}	$4.5^{a,b}$	2.3^{b}	$8.1^{a,b}$	***
Percent with SNF beds	6.9	7.6	8.6	8.1	
Percent with rehab beds	0.0^{c}	0.0^{c}	100.0^{a}	24.2^{b}	****
Percent with a nursing home unit	6.7	4.5	7.8	8.1	
Mean number of acute care beds	273.0^{c}	$376.0^{a,b}$	416.0^{a}	351.0^{b}	****
Percent teaching	8.3^{b}	18.2^{b}	32.0^{a}	12.1^{b}	****
Mean proportion of inpatient days that are DRG 210 inpatient days	0.0042^{a}	$0.0037^{a,b}$	0.0035^{b}	$0.0038^{a,b}$	***

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[1] **** F-test significant at .01% or .0001
*** F-test significant at .1% or .001
** F-test significant at 1% or .01
* F-test significant at 5% or .05

a,b,c denote means that are not significantly different from one another as tested using the Tukey's studentized range (HSD) test

Table 4 (continued)
Comparison of 1984 Study Hospitals by Group Code

Variable	No Rehab (n=639)	Rehab87 (n=66)	Rehab (n=128)	Excluded (n=149)	Significance[1]
Process					
Mean number of DRG 210 discharges	38.5[b]	54.8[a]	54.0[a]	47.8[a]	****
Mean number of surgeries per case	1.4	1.4	1.5	1.5	
Mean number of patients with outpatient charges	29.0[b]	41.2[a]	41.2[a]	33.9[b]	****
Mean percent of patients with outpatient charges	74.1	75.7	75.7	71.0	
Mean outpatient charges (deflated) $	73.00	85.00	79.00	79.00	
Mean number of patients with physical therapy	32.3[b]	44.8[a]	44.3[a]	40.1[a]	****
Mean percent of patients with physical therapy charges	84.8	81.8	83.4	84.1	
Mean physical therapy charge (deflated) $	337.00	345.00	362.00	335.00	
Average length of stay for DRG 210	15.2	15.3	15.9	15.8	
Average length of stay by discharge destination:[2]					
Discharged home	15.3	16.2	16.5	16.0	*
Discharged SNF	13.7	13.6	13.4	14.7	
Discharged other (rehab)	4.7[b]	6.6[a,b]	9.1[a]	6.8[a,b]	****
Discharged home health	8.4	8.8	7.8	10.5	*
Discharged all others	13.5	14.2	15.3	15.4	

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[1] **** F-test significant at .01% or .0001
*** F-test significant at .1% or .001
** F-test significant at 1% or .01
* F-test significant at 5% or .05

a,b,c denote means that are not significantly different from one another as tested using the Tukey's studentized range (HSD) test

[2] These are the overall organizational average length of stay for individuals discharged for each of these discharge destinations, e.g., the average length of stay for individuals discharged home.

Table 4 (continued)
Comparison of 1984 Study Hospitals by Group Code

Variable	No Rehab (n=639)	Rehab87 (n=66)	Rehab (n=128)	Excluded (n=149)	Significance[1]
OUTPUTS					
Percent by discharge destination:					
Discharged home	49.4	47.2	51.5	49.8	
Discharged SNF	30.2	28.3	26.0	28.3	
Discharged other (rehab)	2.4^{b}	$3.7^{a,b}$	5.9^{a}	2.7^{b}	****
Discharged home health	6.1	6.2	4.9	6.3	
Discharged all others	11.9	14.6	11.6	12.9	
Deflated total charges ($)	7957.00^{b}	7969.00^{b}	8940.00^{a}	$8176.00^{a,b}$	**
ENVIRONMENT					
Medicare inpatient days as a percent of total inpatient days	45.3	42.4	43.1	43.5	*
Percent by AHA Region:					
Northeast	3.3	3.0	2.3	3.4	
Mid-Atlantic	6.1	3.0	10.2	2.7	*
South Atlantic	23.0^{a}	7.6^{b}	$10.9^{a,b}$	$14.8^{a,b}$	***
East North Central	23.8	31.8	25.8	26.8	
East South Central	6.3	6.1	3.1	4.7	
West North Central	7.2	12.1	14.1	9.4	
West South Central	11.7	13.6	8.6	21.5	**
Mountain	2.7	6.1	6.3	8.1	**
Pacific	15.9	16.7	18.8	8.7	

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[1] **** F-test significant at .01% or .0001
*** F-test significant at .1% or .001
** F-test significant at 1% or .01
* F-test significant at 5% or .05

a,b,c denote means that are not significantly different from one another as tested using the Tukey's studentized range (HSD) test

1984 Throughputs--ANOVA Results

Hospital structural characteristics. No differences were found among the groups on the percentage that were governmental hospitals. A larger percentage of hospitals in the rehab group than in the no rehab group were not-for-profit in 1984. Rehab group hospitals had a much lower percentage of for-profit hospitals than did the no rehab group. No differences were found among the groups on either the percentage with skilled nursing beds or the percent with a nursing home unit. Hospitals in the rehab group had a higher number of acute care beds than hospitals in either the no rehab or the excluded group. A significantly larger percentage of hospitals in the rehab group were teaching hospitals with no differences found on the characteristic among the remaining three groups. Interestingly, hospitals in the rehab group had a significantly smaller proportion of inpatient days that are DRG 210 than did the hospitals in the no rehab group.

Process. Hospitals in the rehab group were similar to the rehab87 and the excluded group in terms of mean number of discharges in DRG 210. All three of these groups had a signficantly higher number of discharges than the no rehab group. All hospital groups were similar in the mean number of surgeries per case. No differences were found among the hospital groups on either the percentage of patients with outpatient charges or the mean charges associated with outpatient service use. No differences were found on the mean percentage of patients with physical therapy or the mean charge for physical therapy. No differences were found on the average length of stay. However, the ANOVA found a significant difference among the groups on the percentage discharged home and discharged to home health (although the Tukey test did not indicate which means were different). Hospitals in the rehab group discharged a higher percentage of hip fracture patients into rehab than did those in the no rehab group, but the other two groups did not differ from the rehab group on this variable. No differences were found on percentage discharges to either the SNF or in the category reflecting all other discharge destinations.

1984 Outputs--ANOVA Results

No differences among the groups are found in the percentage discharged home, to a skilled nursing facility, to home health or to all other destinations. The only significant difference was found in the percentage discharged to rehab. Hospitals in the rehab group had a significantly higher percentage of discharges to this destination than did hospitals in the no rehab group or the excluded group. No differences among the other three groups of hospitals was found on this variable. Average total charges were higher for the rehab group than for either the no rehab or the rehab87 group, but were similar to the excluded group.

1984 Environment--ANOVA Results

A significant difference among the groups was found in dependence on Medicare inpatient days as a percent of total inpatient days. However, the Tukey test failed to find any differences, so only the finding of the overall ANOVA is reported. Regional differences in distribution of the percentage of hospital groups found in several of the AHA regions.

1987 Inputs--ANOVA Results

Table 5 presents the results of the 1987 analyses. As in 1984, no differences were found on any of the patient characteristics. Over 63% of patients in all hospital groups were age 80 or over. Approximately 80% of patients were female, and, the mean number of diagnoses was almost four for all the groups.

1987 Throughputs--ANOVA Results

Hospital structural characteristics. Again, no difference was found in the percentage in each group that were governmental hospitals. However, again a larger percentage of rehab group hospitals than no rehab group hospitals were not-for-profit. Rehab group hospitals did not differ from the other two groups on this variable. Only 2.4% of rehab group hospitals were for-profit hospitals, compared to 16.1% of no rehab hospitals and 12.0% of the excluded group. The rehab87 group was not significantly different from the rehab group. A difference among the groups was found on the percentage with skilled nursing beds, but not on the percentage with a nursing home unit. Again, rehab group hospitals have a greater number of acute care beds than the no rehab and excluded groups, but are similar in size to the rehab87 group. Again, differences are found in the proportion of inpatient days consumed by DRG 210, rehab group hospitals again having a smaller proportion than no rehab group hospitals. Similar to 1984, the rehab group hospitals have a much higher percentage of teaching hospitals (29.8%) than either the no rehab group (8.7%), the rehab87 group (18.9%), or the excluded group (15.0%).

Process. Again, rehab group hospitals are similar to rehab87 and excluded group hospitals in terms of mean number of DRG 210 discharges. Only the no rehab group has a lower average number of discharges. No differences are seen in the mean number of surgeries per case. Contrary to 1984 findings, in 1987, differences are found in the percentage of patients with outpatient charges. Differences in mean outpatients charges were also detected. However, no difference in the average percentage of patients with physical therapy charges were found nor were any differences in physical therapy charges discovered. In contrast to 1984, differences in overall average length of stay for DRG 210 were found as well as differences in average length of stay by discharge destination. The average length of stay for those discharged home was longer for those in rehab group hospitals than for those in the no rehab group, but was similar to the other two groups of hospitals. A longer average length of stay was also found for those discharged to the destination that includes rehab for those in the rehab group (10.8) than those in either the no rehab or excluded groups. A similar length of stay was found for those in the rehab87 group. No differences were found in average length of stay for those discharged to either a skilled nursing facility or home health services. A difference in average length of stay was found for the destination including all other sites.

Table 5
Comparison of 1987 Study Hospitals by Group Code

Variable	No Rehab (n=922)	Rehab87 (n=90)	Rehab (n=168)	Excluded (n=200)	Significance[1]
INPUTS (Patient Characteristics)					
Age group mean	7.1	7.1	7.0	7.1	
Percent age 80 and over	64.6	65.5	63.7	65.1	
Percent female	79.8	79.5	79.5	79.9	
Mean number of diagnoses	3.7	3.6	3.7	3.6	
THROUGHPUTS					
Structure (Hospital Characteristics)					
Percent governmental	12.5	10.0	10.7	8.5	
Percent not-for-profit	71.4^{b}	85.6^{a}	86.9^{a}	$79.5^{a,b}$	****
Percent for-profit	16.1^{a}	$4.4^{b,c}$	2.4^{c}	$12.0^{a,b}$	****
Percent with SNF beds	11.9	20.0	17.2	17.0	*
Percent with rehab beds	0.0^{c}	100.0^{a}	100.0^{a}	42.5^{b}	****
Percent with a nursing home unit	10.2	14.4	13.7	16.0	
Mean number of acute care beds	258.00^{c}	$378.00^{a,b}$	398.00^{a}	348.00^{b}	****
Percent teaching	8.7^{c}	18.9^{b}	29.8^{a}	$15.0^{b,c}$	****
Mean proportion of inpatient days that are DRG 210 inpatient days	0.0050^{a}	$0.0042^{a,b}$	0.0039^{b}	$0.0044^{a,b}$	****

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[1] **** F-test significant at .01% or .0001
*** F-test significant at .1% or .001
** F-test significant at 1% or .01
* F-test significant at 5% or .05

a,b,c denote means that are not significantly different from one another as tested using the Tukey's studentized range (HSD) test

Table 5 (continued)
Comparison of 1987 Study Hospitals by Group Code

Variable	No Rehab (n=922)	Rehab87 (n=90)	Rehab (n=168)	Excluded (n=200)	Significance[1]
Process					
Mean number of DRG 210 discharges	39.5^{b}	57.7^{a}	54.2^{a}	51.4^{a}	****
Mean number of surgeries per case	1.7	1.6	1.7	1.7	
Mean number of patients with outpatient charges	6.1^{b}	14.7^{a}	13.2^{a}	7.6^{b}	****
Mean percent of patients with outpatient charges	15.7^{b}	24.7^{a}	$22.9^{a,b}$	15.4^{b}	**
Mean outpatient charges (deflated) $	25.00	38.00	34.00	35.00	*
Mean number of patients with physical therapy	35.1^{b}	50.8^{a}	47.1^{a}	45.1^{a}	****
Mean percent of patients with physical therapy charges	89.3	87.7	88 4	88.2	
Mean physical therapy charge (deflated) $	327.00	350.00	327.00	331.00	
Average length of stay for DRG 210	13.5	14.3	14.1	14.1	**
Average length of stay by discharge destination:[2]					
Discharged home	12.5^{b}	$13.3^{a,b}$	13.7^{a}	$13.5^{a,b}$	***
Discharged SNF	13.2	13.3	13.6	13.7	
Discharged other (rehab)	6.7^{c}	$9.8^{a,b}$	10.8^{a}	$7.9^{b,c}$	****
Discharged home health	9.3	11.3	10.2	9.8	
Discharged all others	12.6	13.7	13.4	14.4	*

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[1] **** F-test significant at .01% or .0001
*** F-test significant at .1% or .001
** F-test significant at 1% or .01
* F-test significant at 5% or .05

a,b,c denote means that are not significantly different from one another as tested using the Tukey's studentized range (HSD) test

[2] These are the overall organizational average length of stay for individuals discharged for each of these discharge destinations, e.g., the average length of stay for individuals discharged home.

Table 5 (continued)
Comparison of 1987 Study Hospitals by Group Code

Variable	No Rehab (n=922)	Rehab87 (n=90)	Rehab (n=168)	Excluded (n=200)	Significance[1]
OUTPUTS					
Percent by discharge destination:					
Discharged home	32.1	29.3	35.3	30.0	
Discharged SNF	37.8	38.9	32.9	38.5	*
Discharged other (rehab)	5.5^{b}	7.7^{b}	11.5^{a}	$8.4^{a,b}$	****
Discharged home health	9.7	9.1	8.0	7.8	
Discharged all others	14.9	15.0	12.5	15.4	
Deflated total charges ($)	7762.00	7834.00	8295.00	8006.00	
ENVIRONMENT					
Medicare inpatient days as a percent of total inpatient days	45.5	44.5	43.4	44.7	
Percent by AHA Region:					
Northeast	3.0	3.3	5.4	3.5	
Mid-Atlantic	9.8	4.4	11.3	7.0	
South Atlantic	21.2^{a}	7.8^{b}	$10.7^{a,b}$	$13.5^{a,b}$	****
East North Central	20.0	28.9	25.6	26.5	*
East South Central	8.1	5.6	2.4	7.0	
West North Central	6.1	13.3	10.7	9.0	*
West South Central	12.1	13.3	8.3	17.5	
Mountain	3.4	7.8	6.0	7.0	*
Pacific	$16.3^{a,b}$	$15.6^{a,b}$	19.6^{a}	9.0^{b}	*

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[1] **** F-test significant at .01% or .0001
*** F-test significant at .1% or .001
** F-test significant at 1% or .01
* F-test significant at 5% or .05

a,b,c denote means that are not significantly different from one another as tested using the Tukey's studentized range (HSD) test

1987 Outputs--ANOVA Results

No differences were found in the percentage of patients discharged home, to home health services, or to the destination containing all other sites. Slight differences were detected in the percentage discharged to a skilled nursing facility. Rehab group hospitals had the highest (11.5%) percent of patients discharged to the destination containing rehab relative to either the no rehab group or the rehab87 group. No difference was found between the rehab group and the excluded hospitals on the percent discharged to this destination. No differences were found among the groups on the average deflated total charges per case.

1987 Environment--ANOVA Results

No differences among the groups were detected on the variable measuring Medicare dependence. Some regional differences were found in the percentage distribution of the various groups.

1990 Inputs--ANOVA Results

Table 6 shows that, in 1990, as in previous study years, no differences were found on mean age group, the percent over age 80 in each group, or gender. Difference were found in the mean number of diagnoses with rehab group hospital patients having a slightly higher average number (4.5) than rehab87 group patients (4.4).

1990 Throughputs--ANOVA Results

Hospital structural characteristics. Similar patterns of differences are seen on the throughput variables in 1990 as in 1987 with two exceptions. Rehab group hospitals still have a larger percentage of teaching hospitals (25.5%) relative to the no rehab group (6.5%) and the excluded group (11.8%), but are no longer different from the rehab87 group. The other difference from the 1987 pattern is found in the proportion of inpatient days absorbed by patients in DRG 210. The

Table 6
Comparison of 1990 Study Hospitals by Group Code

Variable	No Rehab (n=861)	Rehab87 (n=92)	Rehab (n=157)	Excluded (203)	Significance[1]
INPUTS (Patient Characteristics)					
Age	7.1	7.1	7.1	7.1	
Percent age 80 and over	66.8	67.0	66.6	67.3	
Percent female	79.1	80.0	78.0	79.1	
Mean number of diagnoses	$4.5^{a,b}$	4.4^{b}	4.5^{a}	$4.4^{a,b}$	*
THROUGHPUTS					
Structure (Hospital Characteristics)					
Percent governmental	10.9	7.6	7.6	8.3	
Percent not-for-profit	70.5^{b}	85.9^{a}	89.8^{a}	$78.3^{a,b}$	****
Percent for-profit	18.5^{a}	$6.5^{b,c}$	2.5^{c}	$13.3^{a,b}$	****
Percent with SNF beds	19.5	29.3	23.6	28.6	**
Percent with rehab beds	0.0^{c}	100.0^{a}	100.0^{a}	82.8^{b}	****
Percent with a nursing home unit	17.2	19.6	17.8	21.7	
Mean number of acute care beds	262.00^{c}	$371.00^{a,b}$	393.00^{a}	344.00^{b}	****
Percent teaching	6.5^{c}	$18.5^{a,b}$	25.5^{a}	$11.8^{b,c}$	****
Mean proportion of inpatient days that are DRG 210 inpatient days	0.0047^{a}	$0.0036^{b,c}$	0.0035^{c}	$0.0041^{a,b}$	****

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[1] **** F-test significant at .01% or .0001
*** F-test significant at .1% or .001
** F-test significant at 1% or .01
* F-test significant at 5% or .05

a,b,c denote means that are not significantly different from one another as tested using the Tukey's studentized range (HSD) test

Table 6 (continued)
Comparison of 1990 Study Hospitals by Group Code

Variable	No Rehab (n=861)	Rehab87 (n=92)	Rehab (n=157)	Excluded (203)	Significance[1]
Process					
Mean number of DRG 210 discharges	37.8^{b}	47.5^{a}	49.4^{a}	46.0^{a}	****
Mean number of surgeries per case	1.7	1.7	1.8	1.7	
Mean number of patients with outpatient charges	5.6^{c}	$10.3^{a,b}$	11.9^{a}	$7.4^{b,c}$	****
Mean percent of patients with outpatient charges	14.6	20.9	21.9	15.0	**
Mean outpatient charges (deflated) $	43.00	61.00	69.00	50.00	**
Mean number of patients with physical therapy	34.1^{b}	42.4^{a}	43.6^{a}	41.2^{a}	****
Mean percent of patients with physical therapy charges	90.6	89.9	89.3	89.3	
Mean physical therapy charge (deflated) $	355.00	367.00	341.00	341.00	
Average length of stay for for DRG 210	12.5	13.2	13.0	12.6	
Average length of stay by discharge destination:[2]					
Discharged home	11.4	12.4	11.8	12.6	
Discharged SNF	12.4^{b}	14.6^{a}	$13.7^{a,b}$	$12.9^{a,b}$	**
Discharged other (rehab)	7.8^{b}	10.6^{a}	10.9^{a}	$9.0^{a,b}$	****
Discharged home health	8.9	9.6	10.3	9.7	
Discharged all others	11.8	13.5	12.6	11.9	

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[1] **** F-test significant at .01% or .0001
*** F-test significant at .1% or .001
** F-test significant at 1% or .01
* F-test significant at 5% or .05

a,b,c denote means that are not significantly different from one another as tested using the Tukey's studentized range (HSD) test

[2] These are the overall organizational average length of stay for individuals discharged for each of these discharge destinations, e.g., the average length of stay for individuals discharged home.

Table 6 (continued)
Comparison of 1990 Study Hospitals by Group Code

Variable	No Rehab (n=861)	Rehab87 (n=92)	Rehab (n=157)	Excluded (203)	Significance[1]
OUTPUTS					
Percent by discharge destination:					
Discharged home	21.9	21.0	21.6	19.0	
Discharged SNF	45.7	40.4	40.4	40.4	**
Discharged other (rehab)	9.3^{b}	15.9^{a}	15.9^{a}	16.9^{a}	****
Discharged home health	8.7	6.9	8.8	7.5	
Discharged all others	14.5	15.8	13.3	16.3	
Deflated total charges ($)	8942.00^{a,b}	9612.00^{a,b}	9733.00^{a}	8724.00^{b}	*
ENVIRONMENT					
Medicare inpatient days as a percent of total inpatient days	49.3	47.3	46.5	49.0	*
Percent by AHA Region:					
Northeast	2.7	2.2	5.7	4.4	
Mid-Atlantic	9.8	3.3	10.2	6.4	
South Atlantic	23.0^{a}	8.7^{b}	10.8^{b}	12.8^{a,b}	****
East North Central	19.6	28.3	26.1	24.6	
East South Central	7.5	5.4	2.5	7.4	
West North Central	6.0	13.0	11.5	8.9	**
West South Central	12.2^{a,b}	14.1^{a,b}	7.6^{b}	19.2^{a}	**
Mountain	3.5	8.7	6.4	7.4	*
Pacific	15.7^{a,b}	16.3^{a,b}	19.1^{a}	8.9^{b}	*

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[1] **** F-test significant at .01% or .0001
*** F-test significant at .1% or .001
** F-test significant at 1% or .01
* F-test significant at 5% or .05

a,b,c denote means that are not significantly different from one another as tested using the Tukey's studentized range (HSD) test

rehab group still has the smallest proportion (0.0035), but is no longer similar to the excluded group in terms of this proportion of discharges.

Process. As in 1987, differences exist among the groups on percent of patients with outpatient charges and a difference still is found in charges. No difference is found on the percentage of patients with physical therapy and no differences in charges for physical therapy is found among the groups. In contrast to 1987, but similar to 1984, no difference in overall average length of stay for DRG 210 is found. Differences in average length of stay still exist by discharge destination. There is no longer a difference in average length of stay for those discharged home. In contrast to 1984 and 1987, a difference in average length of stay for those discharged to a skilled nursing facility is found. The rehab group, the rehab87 group, and the excluded group all have similar ALOS, but the no rehab group has a significantly shorter average length of stay for patients who ultimately are discharged to a skilled nursing facility. Average length of stay for those discharged to the destination which includes rehab facilitities is longer for hospitals in the rehab group, the rehab87 group, and the excluded group in contrast to the no rehab group. As in 1987, no differences are found in average length of stay for those who are discharged to home health services. Last, as in 1984, no differences are found among the groups in the average length of stay for those discharged to all other sites.

1990 Outputs--ANOVA Results

As in 1984 and 1987, no differences in the percent discharged home, discharged to home health services, or discharged under the category that includes all other destinations exists among the groups. Differences still exist in the percentage of discharges to skilled nursing facilities. A difference in the pattern of discharges to the category which includes rehab is found in 1990. The rehab87 group, the rehab group, and the excluded group all are similar in percentage of discharges to this destination. However, the no rehab group discharges a significantly smaller percentage of discharges to this destination. Percentages discharged to this destination have risen in all groups during the study time frame, reflecting the change in definition for this diagnosis related group in 1987, which removed cases without complications and comorbidity. This change is also reflected in the declining percentages of cases discharged home.

Differences are found in the deflated total charges among the groups. Average total charges for the rehab group are higher than those for the excluded group, but are similar to those for the no rehab group and the rehab87 group.

1990 Environment--ANOVA Results

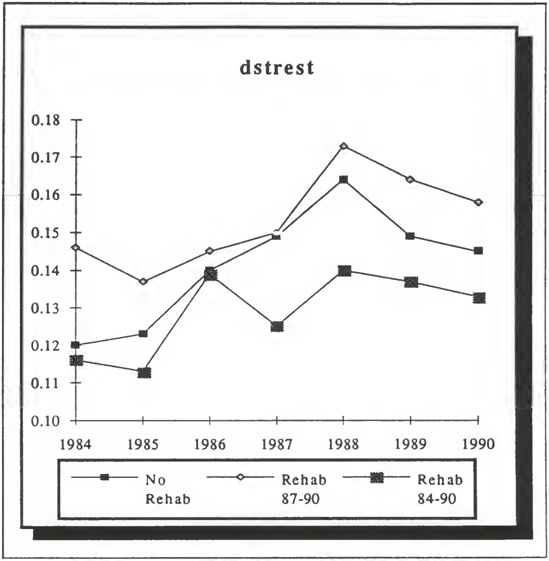
Slight differences were found among the groups in Medicare dependence. Again, regional differences in percentage distribution of the four groups is found.

Appendix D

Figure 1:	**Trend in Proportion of DRG 210 Patients Discharged to Intermediate Care Facilities, Against Medical Advice, or Died**
Figure 2:	**Trend in Mean Average Length of Stay (ALOS) for those Discharged to Intermediate Care Facilities, Against Medical Advice, or Died**

Appendix D

Figure 1. Trend in Proportion of DRG 210 Patients Discharged to Intermediate Care Facilities (ICF), Against Medical Advice (AMA), or Died.



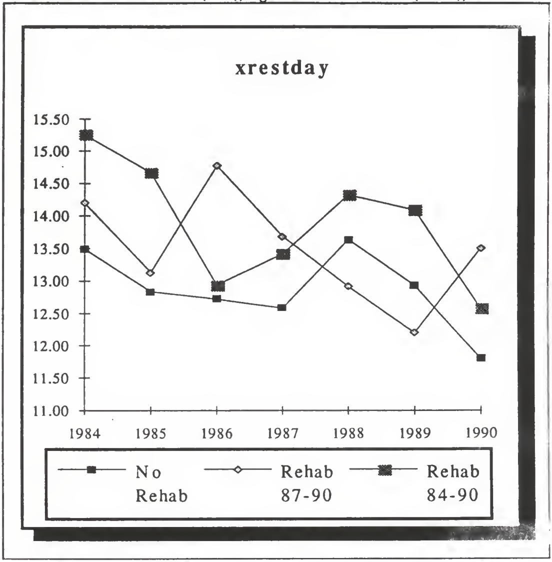
Proportion of DRG 210 Patients Discharged to ICFs, AMA, or Die (dstrest).

Group=	A	B	C	Total Study Sample	Equal Groups alpha=.05*
YEAR	No Rehab	Rehab 87-90	Rehab		
1984	0.12	0.15	0.12	0.12	ABC
1985	0.12	0.14	0.11	0.12	ABC
1986	0.14	0.15	0.14	0.14	ABC
1987	0.15	0.15	0.13	0.15	ABC
1988	0.16	0.17	0.14	0.16	ABC
1989	0.15	0.16	0.14	0.15	ABC
1990	0.15	0.16	0.13	0.14	ABC

*=ANOVA indicates groups different at the 0.05 level but Tukey does not.

Appendix D

Figure 2. Trend in Mean Average Length of Stay (ALOS) for those Discharged to Intermediate Care Facilities(ICF), Against Medical Advice(AMA), or Died.



Mean ALOS for those Discharged ICFs, AMA, or Died (xrestday).

Group=	A	B	C	Total Study	Equal Groups
YEAR	No Rehab	Rehab 87-90	Rehab	Sample	alpha=.05*
1984	13.49	14.19	15.25	13.82	ABC
1985	12.84	13.13	14.66	13.13	ABC
1986	12.72	14.77	12.94	12.90	ABC
1987	12.58	13.69	13.42	12.78	ABC
1988	13.63	12.91	14.32	13.67	ABC
1989	12.93	12.20	14.09	13.04	ABC
1990	11.80	13.51	12.58	12.05	ABC

*=ANOVA indicates groups different at the 0.05 level but Tukey does not.

Appendix E

Detailed Regression Results: Total Sample

Appendix E.

Table 1. Effects of System Variables on Proportion Discharged Home*
All Hospitals (N=3428)
Only Hospital-Years with Percent Discharged to Other, SNF, and Home Greater Than 0

```
DEP VARIABLE: LDSTHOME
ANALYSIS OF VARIANCE

                    SUM OF         MEAN
SOURCE     DF      SQUARES       SQUARE       F VALUE       PROB>F

MODEL      34    291.02891   8.55967369        32.145       0.0001
ERROR    3393    903.49244   0.26628130
C TOTAL  3427   1194.52135

    ROOT MSE     0.5160245     R-SQUARE        0.2436
    DEP MEAN      1.731566     ADJ R-SQ        0.2361
    C.V.          29.80103

PARAMETER ESTIMATES


                 PARAMETER       STANDARD      T FOR H0:                       STANDARDIZED
VARIABLE  DF      ESTIMATE          ERROR    PARAMETER=0      PROB > |T|           ESTIMATE

INTERCEP   1    6.21768265     0.84742780          7.337          0.0001                  0
LAGE       1   -1.63803847     0.28951480         -5.658          0.0001        -0.09055463
LGENDER    1   -0.09105225     0.09711594         -0.938          0.3485        -0.01457039
LNODX      1   -0.33421891     0.07727282         -4.325          0.0001        -0.08656282
SNFBED     1   -0.04181992     0.05688500         -0.735          0.4623        -0.02462667
HALF       1   -0.14477929     0.03542775         -4.087          0.0001        -0.07095000
NR         1   -0.04548762     0.02394252         -1.900          0.0575        -0.03526899
NHOMUNIT   1   -0.06618210     0.06085999         -1.087          0.2769        -0.03676095
TEACH      1    0.09295827     0.02869813          3.239          0.0012         0.05590368
C_STGOV    1   -0.01094280     0.03213690         -0.341          0.7335       -0.005489888
C_FP       1   -0.01381127     0.03469047         -0.398          0.6906       -0.007370709
LDRG210D   1   -0.46759496     0.27630970         -1.692          0.0907        -0.03511175
SMALHOSP   1    0.04647732     0.02845539          1.633          0.1025         0.03276706
LARGHOSP   1    0.06665835     0.02609706          2.554          0.0107         0.05137401
LNDIS      1   -0.05846413     0.02693537         -2.171          0.0300        -0.05008767
LNUMSURG   1   0.000674948     0.05421622          0.012          0.9901        0.000199485
LDEPTCH    1   -0.02619544     0.01698763         -1.542          0.1232        -0.02614162
LPEROUTP   1  -0.006958026     0.01464545         -0.475          0.6347        -0.01426382
LDEOUTPT   1  -0.002618256    0.007574626         -0.346          0.7296       -0.009922130
LXHOMEDA   1    0.38530357     0.04685807          8.223          0.0001         0.17893571
LXOTHDAY   1   0.002347089     0.02581733          0.091          0.9276        0.001573503
LXSNFDAY   1    0.09190649     0.04419168          2.080          0.0376         0.04583200
CHRGPDAY   1   -0.01898755     0.07500913         -0.253          0.8002       -0.007881364
LEMCRDEP   1   -0.12741208     0.03224311         -3.952          0.0001        -0.06751785
YEAR       1   -0.07083485    0.006932550        -10.218          0.0001        -0.22907310
RELWT      1   -0.22408666     0.19753996         -1.134          0.2567        -0.01917009
OUTLIER    1  -0.002163662    0.002680602         -0.807          0.4196        -0.01377072
REG_NE     1   -0.10531455     0.05028746         -2.094          0.0363        -0.03432824
REG_MA     1   -0.01648222     0.03136639         -0.525          0.5993       -0.009936334
REG_SA     1    0.24487221     0.03150412          7.773          0.0001         0.15679640
REG_ESC    1    0.26167038     0.04117755          6.355          0.0001         0.11201356
REG_WNC    1   -0.08029830     0.03916364         -2.050          0.0404        -0.03725507
REG_WSC    1    0.28244377     0.03802744          7.427          0.0001         0.13919708
REG_MTN    1    0.30001541     0.04974637          6.031          0.0001         0.10059031
REG_PAC    1    0.06531762     0.03501831          1.865          0.0622         0.03882759
```

*"L" prior to variable name indicates that the natural log of the variable was used in the analysis.

Appendix E.

Table 2. Effects of System Variables on Proportion Discharged to an SNF*
All Hospitals (N=3428)
Only Hospital-Years with Percent Discharged to Other, SNF, and Home Greater Than 0

```
DEP VARIABLE: LDSTSNF
ANALYSIS OF VARIANCE

                   SUM OF          MEAN
SOURCE     DF     SQUARES        SQUARE       F VALUE       PROB>F

MODEL      34   277.36001    8.15764731        30.851       0.0001
ERROR    3393   897.18541    0.26442246
C TOTAL  3427  1174.54542

    ROOT MSE    0.5142202      R-SQUARE        0.2361
    DEP MEAN     1.975795      ADJ R-SQ        0.2285
    C.V.           26.026

PARAMETER ESTIMATES

                    PARAMETER       STANDARD    T FOR H0:                       STANDARDIZED
VARIABLE  DF         ESTIMATE          ERROR  PARAMETER=0       PROB > |T|          ESTIMATE

INTERCEP   1      -1.19451423     0.84446479       -1.415           0.1573                 0
LAGE       1       1.46312032     0.28850252        5.071           0.0001        0.08156966
LGENDER    1      -0.24226535     0.09677638       -2.503           0.0123       -0.03909615
LNODX      1       0.36696633     0.07700263        4.766           0.0001        0.09584924
SNFBED     1       0.03916588     0.05668610        0.691           0.4897        0.02325908
HALF       1       0.11566923     0.03530388        3.276           0.0011        0.05716443
NR         1       0.11642222     0.02385881        4.880           0.0001        0.09103278
NHOMUNIT   1       0.15793143     0.06064720        2.604           0.0093        0.08846608
TEACH      1       0.02901006     0.02859779        1.014           0.3105        0.01759394
C_STGOV    1     -0.003758247     0.03202453       -0.117           0.9066      -0.001901439
C_FP       1       0.10574080     0.03456917        3.059           0.0022        0.05690892
LDRG210D   1       0.60146348     0.27534359        2.184           0.0290        0.04554639
SMALHOSP   1      -0.02139800     0.02835589       -0.755           0.4505       -0.01521359
LARGHOSP   1      -0.09869409     0.02600581       -3.795           0.0002       -0.07670827
LNDIS      1       0.16314431     0.02684119        6.078           0.0001        0.14095332
LNUMSURG   1       0.08431548     0.05402665        1.561           0.1187        0.02513100
LDEPTCH    1       0.01886427     0.01692824        1.114           0.2652        0.01898492
LPEROUTP   1     -0.009504202     0.01459424       -0.651           0.5149       -0.01964842
LDEOUTPT   1      0.002706397    0.007548141        0.359           0.7200        0.01034300
LXHOMEDA   1      -0.20023665     0.04669423       -4.288           0.0001       -0.09377770
LXOTHDAY   1       0.03143928     0.02572706        1.222           0.2218        0.02125555
LXSNFDAY   1      -0.25838396     0.04403716       -5.867           0.0001       -0.12994220
CHRGPDAY   1       0.03208521     0.07474687        0.429           0.6678        0.01343072
LEMCRDEP   1       0.06724786     0.03213038        2.093           0.0364        0.03593755
YEAR       1      0.005088051    0.006908310        0.737           0.4615        0.01659360
RELWT      1       0.05257311     0.19684927        0.267           0.7894       0.004535590
OUTLIER    1      0.004933782    0.002671230        1.847           0.0648        0.03166717
REG_NE     1      -0.11697315     0.05011163       -2.334           0.0196       -0.03845134
REG_MA     1      -0.05790682     0.03125672       -1.853           0.0640       -0.03520482
REG_SA     1      -0.21779747     0.03139396       -6.938           0.0001       -0.14064085
REG_ESC    1      -0.48019659     0.04103358      -11.703           0.0001       -0.20729897
REG_WNC    1      -0.02657033     0.03902671       -0.681           0.4960       -0.01243192
REG_WSC    1      -0.61997050     0.03789447      -16.360           0.0001       -0.30812803
REG_MTN    1      -0.18895760     0.04957243       -3.812           0.0001       -0.06389090
REG_PAC    1     -0.001464670     0.03489587       -0.042           0.9665      -0.000878035
```

*"L" prior to variable name indicates that the natural log of the variable was used in the analysis.

Appendix E.

Table 3. Effects of System Variables on Proportion Discharged to "Other"*
All Hospitals (N=3428)
Only Hospital-Years with Percent Discharged to Other, SNF, and Home Greater Than 0

```
DEP VARIABLE: LDSTOTH
ANALYSIS OF VARIANCE

                        SUM OF          MEAN
SOURCE      DF         SQUARES        SQUARE       F VALUE        PROB>F

MODEL       34       308.18085    9.06414268        26.463        0.0001
ERROR     3393      1162.16884    0.34251955
C TOTAL   3427      1470.34969

    ROOT MSE         0.5852517      R-SQUARE        0.2096
    DEP MEAN          1.069437      ADJ R-SQ        0.2017
    C.V.              54.72519

PARAMETER ESTIMATES


                      PARAMETER        STANDARD       T FOR H0:                      STANDARDIZED
VARIABLE    DF         ESTIMATE           ERROR     PARAMETER=0      PROB > |T|          ESTIMATE

INTERCEP     1       0.33109882      0.96111434           0.344          0.7305                 0
LAGE         1      -0.56586243      0.32835461          -1.723          0.0849       -0.02819578
LGENDER      1       0.14422079      0.11014451           1.309          0.1905        0.02080152
LNODX        1       0.01559724      0.08763934           0.178          0.8588       0.003641118
SNFBED       1      -0.02983861      0.06451640          -0.462          0.6438       -0.01583754
HALF         1      -0.11099644      0.04018055          -2.762          0.0058       -0.04902772
NR           1      -0.19696466      0.02715453          -7.253          0.0001       -0.13764955
NHOMUNIT     1       0.01378726      0.06902466           0.200          0.8417       0.006902568
TEACH        1       0.05545500      0.03254813          -1.704          0.0885       -0.03005936
C_STGOV      1      -0.14262883      0.03644822          -3.913          0.0001       -0.06449544
C_FP         1      -0.03007450      0.03934436          -0.764          0.4447       -0.01446641
LDRG210D     1      -0.52705594      0.31337798          -1.682          0.0927       -0.03567188
SMALHOSP     1     -0.007927135      0.03227281          -0.246          0.8060      -0.005037318
LARGHOSP     1      -0.02632438      0.02959811          -0.889          0.3739       -0.01828663
LNDIS        1      -0.16556652      0.03054888          -5.420          0.0001       -0.12784993
LNUMSURG     1      -0.05697826      0.06148958          -0.927          0.3542       -0.01517876
LDEPTCH      1       0.03470305      0.01926661           1.801          0.0718        0.03121484
LPEROUTP     1      -0.02731839      0.01661021          -1.645          0.1001       -0.05047678
LDEOUTPT     1       0.01311648     0.008590798           1.527          0.1269        0.04480195
LXHOMEDA     1       0.06331282      0.05314430           1.191          0.2336        0.02650161
LXOTHDAY     1      -0.06635376      0.02928085          -2.266          0.0235       -0.04009498
LXSNFDAY     1       0.21190630      0.05012021           4.228          0.0001        0.09524740
CHRGPDAY     1       0.29225823      0.08507197           3.435          0.0006        0.10934169
LEMCRDEP     1       0.05507735      0.03656868           1.506          0.1321        0.02630678
YEAR         1       0.05164822     0.007862585           6.569          0.0001        0.15054597
RELWT        1       0.12132082      0.22404090           0.542          0.5882       0.009354704
OUTLIER      1      0.001113554     0.003040218           0.366          0.7142       0.006388002
REG_NE       1      -0.29985676      0.05703377          -5.258          0.0001       -0.08809752
REG_MA       1       0.41894570      0.03557434          11.777          0.0001        0.22764323
REG_SA       1      -0.17038406      0.03573055          -4.769          0.0001       -0.09833592
REG_ESC      1       0.07527034      0.04670172           1.612          0.1071        0.02904200
REG_WNC      1      -0.05466973      0.04441763          -1.231          0.2185       -0.02286191
REG_WSC      1       0.10121228      0.04312900           2.347          0.0190        0.04495914
REG_MTN      1       0.06779239      0.05642008           1.202          0.2296        0.02048708
REG_PAC      1      -0.27010452      0.03971619          -6.801          0.0001       -0.14472003
```

*"L" prior to variable name   icates that the natural log of the variable was used in the analysis.

Appendix E.

Table 4. Effects of System Variables on Proportion Discharged to Home Health Services*
All Hospitals (N=3428)
Only Hospital-Years with Percent Discharged to Other, SNF, and Home Greater Than 0

```
DEP VARIABLE: LDSTHHS
ANALYSIS OF VARIANCE

                   SUM OF         MEAN
SOURCE     DF     SQUARES       SQUARE      F VALUE       PROB>F

MODEL      34   260.79012   7.67029765       20.539       0.0001
ERROR    3393  1267.09159   0.37344285
C TOTAL  3427  1527.88171

    ROOT MSE    0.6110997     R-SQUARE       0.1707
    DEP MEAN    0.7558705     ADJ R-SQ       0.1624
    C.V.         80.84715

PARAMETER ESTIMATES


                      PARAMETER         STANDARD     T FOR H0:                       STANDARDIZED
VARIABLE   DF          ESTIMATE            ERROR   PARAMETER=0      PROB > |T|           ESTIMATE

INTERCEP    1        5.65194673       1.00356256         5.632          0.0001                  0
LAGE        1       -1.77573972       0.34285660        -5.179          0.0001        -0.08679964
LGENDER     1        0.26843260       0.11500912         2.334          0.0197         0.03798114
LNODX       1        0.30945676       0.09150998         3.382          0.0007         0.07086837
SNFBED      1       -0.20848971       0.06736581        -3.095          0.0020        -0.10855735
HALF        1        0.14591145       0.04195515         3.478          0.0005         0.06322480
NR          1        0.08203903       0.02835383         2.893          0.0038         0.05624351
NHOMUNIT    1       -0.03535020       0.07207317        -0.490          0.6238        -0.01736162
TEACH       1       -0.01790203       0.03398563        -0.527          0.5984       -0.009519340
C_STGOV     1       -0.02566363       0.03805797        -0.674          0.5001        -0.01138427
C_FP        1       -0.06121990       0.04108203        -1.490          0.1363        -0.02888819
LDRG210D    1       -0.56600535       0.32721852        -1.730          0.0838        -0.03757987
SMALHOSP    1       0.006087794       0.03369816         0.181          0.8566        0.003794971
LARGHOSP    1        0.02230635       0.03090533         0.722          0.4705         0.01520091
LNDIS       1        0.05910688       0.03189809         1.853          0.0640         0.04477457
LNUMSURG    1        0.11471365       0.06420531         1.787          0.0741         0.02997834
LDEPTCH     1        0.05833611       0.02011753         2.900          0.0038         0.05147500
LPEROUTP    1        0.05533254       0.01734381         3.190          0.0014         0.10029578
LDEOUTPT    1      -0.005031369      0.008970216        -0.561          0.5749        -0.01685897
LXHOMEDA    1       -0.42442127       0.05549145        -7.648          0.0001        -0.17427826
LXOTHDAY    1        0.05162589       0.03057405         1.689          0.0914         0.03060254
LXSNFDAY    1       -0.02156539       0.05233380        -0.412          0.6803       -0.009508937
CHRGPDAY    1       -0.41791721       0.08882923        -4.705          0.0001        -0.15338213
LEMCRDEP    1        0.06716624       0.03818376         1.759          0.0787         0.03147104
YEAR        1        0.03006447      0.008209841         3.662          0.0003         0.08596719
RELWT       1       -0.30881098       0.23393581        -1.320          0.1869        -0.02335893
OUTLIER     1      -0.009202922      0.003174491        -2.899          0.0038        -0.05178989
REG_NE      1        0.38463888       0.05955270         6.459          0.0001         0.11085837
REG_MA      1       -0.29851769       0.03714550        -8.036          0.0001        -0.15912284
REG_SA      1        0.21446057       0.03730861         5.748          0.0001         0.12142165
REG_ESC     1        0.10308245       0.04876433         2.114          0.0346         0.03901691
REG_WNC     1       -0.11372146       0.04637936        -2.452          0.0143        -0.04665235
REG_WSC     1       -0.19484391       0.04503382        -4.327          0.0001        -0.08490574
REG_MTN     1       -0.33872112       0.05891191        -5.750          0.0001        -0.10041693
REG_PAC     1        0.21720735       0.04147028         5.238          0.0001         0.11416599
```

*"L" prior to variable name indicates that the natural log of the variable was used in the analysis.

Appendix E.

Table 5. Effects of System Variables on Proportion Discharged to "Rest"*
All Hospitals (N=3428)
Only Hospital-Years with Percent Discharged to Other, SNF, and Home Greater Than 0

```
DEP VARIABLE: LDSTREST
ANALYSIS OF VARIANCE

                     SUM OF          MEAN
SOURCE      DF      SQUARES        SQUARE        F VALUE        PROB>F

MODEL       34    215.68630    6.34371478         18.441        0.0001
ERROR     3393   1167.16807    0.34399295
C TOTAL   3427   1382.85437

    ROOT MSE      0.5865091      R-SQUARE         0.1560
    DEP MEAN       1.090957      ADJ R-SQ         0.1475
    C.V.           53.76095

PARAMETER ESTIMATES


                     PARAMETER        STANDARD       T FOR H0:                          STANDARDIZED
VARIABLE    DF        ESTIMATE           ERROR     PARAMETER=0       PROB > |T|             ESTIMATE

INTERCEP     1     -0.23363496      0.96317931          -0.243           0.8084                    0
LAGE         1      1.70865258      0.32906009           5.193           0.0001           0.08779081
LGENDER      1     -0.05636504      0.11038116          -0.511           0.6096         -0.008382994
LNODX        1     -0.01000709      0.08782763          -0.114           0.9093         -0.002408890
SNFBED       1      0.02880120      0.06465501           0.445           0.6560           0.01576311
HALF         1      0.03926094      0.04026688           0.975           0.3296           0.01788197
NR           1     0.003872990      0.02721287           0.142           0.8868          0.002790969
NHOMUNIT     1     -0.02949426      0.06917296          -0.426           0.6699          -0.01522623
TEACH        1     -0.07744146      0.03261806          -2.374           0.0176          -0.04328472
C_STGOV      1      0.01042873      0.03652653           0.286           0.7753          0.004862676
C_FP         1     -0.08610760      0.03942889          -2.184           0.0290          -0.04270964
LDRG210D     1     -0.01845882      0.31405128          -0.059           0.9531         -0.001288236
SMALHOSP     1     -0.03568181      0.03234215          -1.103           0.2700          -0.02338040
LARGHOSP     1      0.06095343      0.02966170           2.055           0.0400           0.04366122
LNDIS        1     -0.08384496      0.03061452          -2.739           0.0062          -0.06676165
LNUMSURG     1    -0.003671598      0.06162169          -0.060           0.9525         -0.001008566
LDEPTCH      1     -0.06863584      0.01930800          -3.555           0.0004          -0.06365998
LPEROUTP     1      0.01934733      0.01664589           1.162           0.2452           0.03686206
LDEOUTPT     1    -0.004568259     0.008609256          -0.531           0.5957          -0.01608986
LXHOMEDA     1     -0.04323429      0.05325848          -0.812           0.4170          -0.01866083
LXOTHDAY     1     -0.05680924      0.02934376          -1.936           0.0530          -0.03539692
LXSNFDAY     1     -0.06794914      0.05022789          -1.353           0.1762          -0.03149309
CHRGPDAY     1     -0.50453491      0.08525475          -5.918           0.0001          -0.19464012
LEMCRDEP     1     -0.03481079      0.03664725          -0.950           0.3422          -0.01714473
YEAR         1      0.02870348     0.007879478           3.643           0.0003           0.08627212
RELWT        1      0.38261297      0.22452226           1.704           0.0885           0.03042121
OUTLIER      1    -0.002822196     0.003046750          -0.926           0.3544          -0.01669410
REG_NE       1      0.17116344      0.05715631           2.995           0.0028           0.05185408
REG_MA       1     -0.25123338      0.03565077          -7.047           0.0001          -0.14076557
REG_SA       1     0.006309433      0.03580731           0.176           0.8601          0.003754877
REG_ESC      1      0.21563757      0.04680206           4.607           0.0001           0.08579248
REG_WNC      1      0.25209288      0.04451306           5.663           0.0001           0.10870470
REG_WSC      1      0.50136342      0.04322166          11.600           0.0001           0.22964633
REG_MTN      1     -0.06371468      0.05654130          -1.127           0.2599          -0.01985459
REG_PAC      1     -0.09057879      0.03980152          -2.276           0.0229          -0.05004324

*"L" prior to variable name indicates that the natural log of the variable was used in the analysis.
```

Appendix E.

Table 6. Effects of System Variables on Deflated Total Charges*
All Hospitals (N=3428)
Only Hospital-Years with Percent Discharged to Other, SNF, and Home Greater Than 0

```
DEP VARIABLE: LDETOTCH
ANALYSIS OF VARIANCE

                    SUM OF         MEAN
SOURCE     DF      SQUARES       SQUARE        F VALUE       PROB>F

MODEL      33    170.37172   5.16277951         82.644       0.0001
ERROR    3394    212.02283   0.06246990
C TOTAL  3427    382.39456

    ROOT MSE     0.2499398     R-SQUARE         0.4455
    DEP MEAN       9.00389     ADJ R-SQ         0.4401
    C.V.          2.775909

PARAMETER ESTIMATES


                      PARAMETER         STANDARD      T FOR H0:                         STANDARDIZED
VARIABLE  DF           ESTIMATE            ERROR    PARAMETER=0        PROB > |T|           ESTIMATE

INTERCEP   1         7.68224269       0.37112176         20.700            0.0001                  0
LAGE       1         0.01626120       0.14106494          0.115            0.9082        0.001588841
LGENDER    1        -0.09672078       0.04699541         -2.058            0.0397        -0.02735530
LNODX      1         0.15484430       0.03743023          4.137            0.0001         0.07088212
SNFBED     1         0.09013952       0.02751867          3.276            0.0011         0.09381643
HALF       1         0.01281715       0.01721563          0.745            0.4566         0.01110142
NR         1         0.03319978       0.01168907          2.840            0.0045         0.04549630
NHOMUNIT   1        -0.07273543       0.02949140         -2.466            0.0137        -0.07140577
TEACH      1         0.16715204       0.01377331         12.136            0.0001         0.17766635
C_STGOV    1        -0.01769199       0.01559770         -1.134            0.2568        -0.01568747
C_FP       1         0.13104414       0.01634836          8.016            0.0001         0.12360453
LDRG210D   1         0.60993521       0.13370461          4.562            0.0001         0.08094825
SMALHOSP   1        -0.15216148       0.01365722        -11.141            0.0001        -0.18960172
LARGHOSP   1         0.10086450       0.01261898          7.993            0.0001         0.13739420
LNDIS      1        -0.17488802       0.01308186        -13.369            0.0001        -0.26481494
LNUMSURG   1         0.15868886       0.02621544          6.053            0.0001         0.08289492
LDEPTCH    1         0.22933024      0.007840261         29.250            0.0001         0.40449135
LPEROUTP   1        -0.01539891      0.007098737         -2.169            0.0301        -0.05579315
LDEOUTPT   1         0.01236664      0.003664527          3.375            0.0007         0.08282964
LDSTHOME   1         0.01238991      0.009437018          1.313            0.1893         0.02189825
LDSTOTH    1         0.01199450      0.008305952          1.444            0.1488         0.02351995
LDSTSNF    1        -0.04567366      0.009825760         -4.648            0.0001        -0.08004696
LEMCRDEP   1         0.03078335       0.01560082          1.973            0.0486         0.02883135
YEAR       1         0.01120560      0.003255017          3.443            0.0006         0.06404769
RELWT      1         0.07266556       0.09538943          0.762            0.4462         0.01098697
OUTLIER    1        0.004790293      0.001296251          3.695            0.0002         0.05388531
REG_NE     1        0.007568657       0.02434118          0.311            0.7559        0.004360368
REG_MA     1         0.07674416       0.01545308          4.966            0.0001         0.08177053
REG_SA     1        -0.03256606       0.01550076         -2.101            0.0357        -0.03685555
REG_ESC    1        -0.07152584       0.02031176         -3.521            0.0004        -0.05411530
REG_WNC    1        -0.06607072       0.01890890         -3.494            0.0005        -0.05417877
REG_WSC    1        -0.16272194       0.01906472         -8.535            0.0001        -0.14173769
REG_MTN    1        -0.06598076       0.02369195         -2.785            0.0054        -0.03909948
REG_PAC    1         0.10014366       0.01587665          6.308            0.0001         0.10521429
```

*"L" prior to variable name indicates that the natural log of the variable was used in the analysis.

Appendix E.

Table 7. Effects of System Variables on Average Length of Stay*
All Hospitals (N=3428)
Only Hospital-Years with Percent Discharged to Other, SNF, and Home Greater Than 0

```
DEP VARIABLE: LLOS
ANALYSIS OF VARIANCE

                   SUM OF          MEAN
SOURCE     DF     SQUARES        SQUARE        F VALUE       PROB>F

MODEL      33  65.16925839   1.97482601         64.594       0.0001
ERROR    3394    103.76426   0.03057285
C TOTAL  3427    168.93352

    ROOT MSE     0.1748509      R-SQUARE        0.3858
    DEP MEAN      2.688973      ADJ R-SQ        0.3798
    C.V.          6.502519

PARAMETER ESTIMATES


                    PARAMETER        STANDARD      T FOR H0:                        STANDARDIZED
VARIABLE  DF         ESTIMATE           ERROR    PARAMETER=0      PROB > |T|           ESTIMATE

INTERCEP   1       2.13975204      0.25962649          8.242          0.0001                  0
LAGE       1      -0.08814540      0.09868512         -0.893          0.3718        -0.01295762
LGENDER    1      -0.06570322      0.03287669         -1.998          0.0457        -0.02795802
LNODX      1       0.16138631      0.02618515          6.163          0.0001         0.11114915
SNFBED     1      0.006989210      0.01925130          0.363          0.7166         0.01094434
HALF       1       0.02354742      0.01204358          1.955          0.0506         0.03068515
NR         1       0.01994934     0.008177347          2.440          0.0148         0.04113083
NHOMUNIT   1     -0.007908766      0.02063137         -0.383          0.7015        -0.01168137
TEACH      1       0.03611650     0.009635423          3.748          0.0002         0.05775600
C_STGOV    1      -0.02466573      0.01091172         -2.260          0.0239        -0.03290547
C_FP       1      -0.08654673      0.01143686         -7.567          0.0001        -0.12281894
LDRG210D   1       0.08703890      0.09353604          0.931          0.3522         0.01737941
SMALHOSP   1      -0.08368793     0.009554215         -8.759          0.0001        -0.15689110
LARGHOSP   1       0.05275367     0.008827889          5.976          0.0001         0.10811369
LNDIS      1      -0.05688119     0.009151705         -6.215          0.0001        -0.12958329
LNUMSURG   1       0.08023171      0.01833959          4.375          0.0001         0.06305586
LDEPTCH    1       0.09838519     0.005484829         17.938          0.0001         0.26108119
LPEROUTP   1     -0.008871321     0.004966080         -1.786          0.0741        -0.04835899
LDEOUTPT   1     -0.001145471     0.002563602         -0.447          0.6550        -0.01154293
LDSTHOME   1       0.02655767     0.006601876          4.023          0.0001         0.07062022
LDSTOTH    1      -0.01372605     0.005810614         -2.362          0.0182        -0.04049467
LDSTSNF    1      -0.05172990     0.006873829         -7.526          0.0001        -0.13640133
LEMCRDEP   1       0.04717727      0.01091390          4.323          0.0001         0.06647828
YEAR       1      -0.03016612     0.002277119        -13.247          0.0001        -0.25940935
RELWT      1       0.17623221      0.06673180          2.641          0.0083         0.04008966
OUTLIER    1      0.000087257     0.000906821          0.096          0.9233        0.001476748
REG_NE     1       0.14992600      0.01702841          8.804          0.0001         0.12995087
REG_MA     1       0.02504181      0.01081055          2.316          0.0206         0.04014349
REG_SA     1     -0.006808283      0.01084391         -0.628          0.5301        -0.01159240
REG_ESC    1      -0.04414539      0.01420955         -3.107          0.0019        -0.05025050
REG_WNC    1      -0.08090758      0.01322814         -6.116          0.0001        -0.09981763
REG_WSC    1      -0.09107918      0.01333715         -6.829          0.0001        -0.11935931
REG_MTN    1      -0.18579960      0.01657423        -11.210          0.0001        -0.16565189
REG_PAC    1      -0.17114686      0.01110686        -15.409          0.0001        -0.27053168
```

*"L" prior to variable name indicates that the natural log of the variable was used in the analysis.

Appendix F

Detailed Regression Results: Hospitals with No Rehab Units Only

Appendix F.

Table 1. Effects of System Variables on Proportion Discharged Home*
Hospitals with No Rehab Units Only (N=2404)
Only Hospital-Years with Percent Discharged to Other, SNF, and Home Greater Than 0

```
DEP VARIABLE: LDSTHOME
ANALYSIS OF VARIANCE

                     SUM OF         MEAN
SOURCE      DF      SQUARES       SQUARE      F VALUE       PROB>F

MODEL       32    187.34885   5.85465145       21.074       0.0001
ERROR     2371    658.68465   0.27780879
C TOTAL   2403    846.03350

    ROOT MSE      0.5270757     R-SQUARE       0.2214
    DEP MEAN       1.731596     ADJ R-SQ       0.2109
    C.V.           30.43873

PARAMETER ESTIMATES


                     PARAMETER       STANDARD      T FOR H0:                    STANDARDIZED
VARIABLE   DF         ESTIMATE          ERROR    PARAMETER=0      PROB > |T|         ESTIMATE

INTERCEP    1       5.54441226     1.03107237          5.377          0.0001                0
LAGE        1      -1.53494962     0.34602386         -4.436          0.0001      -0.08609522
LGENDER     1      -0.12315269     0.11651247         -1.057          0.2906      -0.01989892
LNODX       1      -0.33735468     0.09671393         -3.488          0.0005      -0.08582048
SNFBED      1       0.06831235     0.07976032          0.856          0.3918       0.03805588
NHOMUNIT    1      -0.12947850     0.08365214         -1.548          0.1218      -0.06968837
TEACH       1       0.08990789     0.03871370          2.322          0.0203       0.04793104
C_STGOV     1      -0.01639714     0.03782819         -0.433          0.6647     -0.008525980
C_FP        1      -0.01693834     0.03877897         -0.437          0.6623      -0.01014144
LDRG210D    1      -0.43252546     0.30093778         -1.437          0.1508      -0.03477177
SMALHOSP    1       0.05200994     0.03233435          1.609          0.1079       0.04004441
LARGHOSP    1       0.07311097     0.03301852          2.214          0.0269       0.05081204
LNDIS       1      -0.06687053     0.03326490         -2.010          0.0445      -0.05440286
LNUMSURG    1      -0.05079574     0.06664253         -0.762          0.4460      -0.01489391
LDEPTCH     1      -0.03433397     0.02137570         -1.606          0.1084      -0.03337668
LPEROUTP    1      -0.02261612     0.01864819         -1.213          0.2253      -0.04449940
LDEOUTPT    1      0.006444713    0.009403291          0.685          0.4932       0.02397320
LXHOMEDA    1       0.45312910     0.05802741          7.809          0.0001       0.20785287
LXOTHDAY    1      -0.02277334     0.03173930         -0.718          0.4731      -0.01514295
LXSNFDAY    1       0.15304628     0.05501254          2.782          0.0054       0.07472354
CHRGPDAY    1       0.08904326     0.09241056          0.964          0.3354       0.03723291
LEMCRDEP    1      -0.11822795     0.03917656         -3.018          0.0026      -0.06286932
YEAR        1      -0.06888646    0.008668168         -7.947          0.0001      -0.21983808
RELWT       1      -0.24931026     0.24100847         -1.034          0.3010      -0.02128551
OUTLIER     1     -0.001423252    0.003312394         -0.430          0.6675     -0.009031011
REG_NE      1      -0.07466949     0.06495272         -1.150          0.2504      -0.02298046
REG_MA      1      -0.05642892     0.03824612         -1.475          0.1402      -0.03488504
REG_SA      1       0.22024488     0.03823911          5.760          0.0001       0.14989896
REG_ESC     1       0.25740368     0.04770064          5.396          0.0001       0.12037550
REG_WNC     1      -0.13818548     0.05260115         -2.627          0.0087      -0.05669012
REG_WSC     1       0.25436000     0.04718058          5.391          0.0001       0.12685152
REG_MTN     1       0.18562688     0.06951224          2.670          0.0076       0.05333476
REG_PAC     1       0.04408310     0.04422919          0.997          0.3190       0.02547436
```

*"L" prior to variable name indicates that the natural log of the variable was used in the analysis.

Appendix F.

Table 2. Effects of System Variables on Proportion Discharged to an SNF*
Hospitals with No Rehab Units Only (N=2404)
Only Hospital-Years with Percent Discharged to Other, SNF, and Home Greater Than 0

```
DEP VARIABLE: LDSTSNF
ANALYSIS OF VARIANCE

                   SUM OF           MEAN
SOURCE     DF     SQUARES         SQUARE       F VALUE        PROB>F

MODEL       32   196.41550     6.13798439       23.210        0.0001
ERROR     2371   627.00854     0.26444898
C TOTAL   2403   823.42404

    ROOT MSE      0.514246       R-SQUARE       0.2385
    DEP MEAN      1.990494       ADJ R-SQ       0.2283
    C.V.           25.8351

PARAMETER ESTIMATES


                   PARAMETER          STANDARD      T FOR H0:                         STANDARDIZED
VARIABLE  DF        ESTIMATE             ERROR    PARAMETER=0      PROB > |T|             ESTIMATE

INTERCEP   1     -1.83680519        1.00597481         -1.826          0.0680                    0
LAGE       1      1.25612590        0.33760122          3.721          0.0002           0.07141675
LGENDER    1     -0.22359081        0.11367641         -1.967          0.0493          -0.03662028
LNODX      1      0.34891450        0.09435980          3.698          0.0002           0.08997156
SNFBED     1      0.19811287        0.07781886          2.546          0.0110           0.11187091
NHOMUNIT   1      0.04916031        0.08161594          0.602          0.5470           0.02682003
TEACH      1     -0.01775106        0.03777137         -0.470          0.6384         -0.009592355
C_STGOV    1    -0.006472321        0.03690741         -0.175          0.8608         -0.003411287
C_FP       1      0.09628900        0.03783504          2.545          0.0110           0.05843697
LDRG210D   1      0.64955247        0.29361259          2.212          0.0270           0.05293115
SMALHOSP   1     -0.03565479        0.03154729         -1.130          0.2585          -0.02782630
LARGHOSP   1     -0.11226827        0.03221481         -3.485          0.0005          -0.07909028
LNDIS      1      0.16240119        0.03245519          5.004          0.0001           0.13392395
LNUMSURG   1      0.22327556        0.06502037          3.434          0.0006           0.06635974
LDEPTCH    1      0.01367063        0.02085539          0.655          0.5122           0.01347068
LPEROUTP   1     0.006467567        0.01819427          0.355          0.7223           0.01289909
LDEOUTPT   1    -0.004054098       0.009174403         -0.442          0.6586          -0.01528617
LXHOMEDA   1     -0.16948529        0.05661496         -2.994          0.0028          -0.07880397
LXOTHDAY   1      0.02214673        0.03096673          0.715          0.4746           0.01492710
LXSNFDAY   1     -0.13820976        0.05367346         -2.575          0.0101          -0.06839988
CHRGPDAY   1      0.20754409        0.09016118          2.302          0.0214           0.08796670
LEMCRDEP   1      0.08275621        0.03822295          2.165          0.0305           0.04460682
YEAR       1     0.000075437       0.008457174          0.009          0.9929          0.000244026
RELWT      1      0.09641950        0.23514203          0.410          0.6818          0.008344317
OUTLIER    1     0.004479434       0.003231767          1.386          0.1659           0.02881109
REG_NE     1     -0.10414438        0.06337170         -1.643          0.1004          -0.03248878
REG_MA     1    -0.008686388        0.03731516         -0.233          0.8159         -0.005443256
REG_SA     1     -0.20324014        0.03730833         -5.448          0.0001          -0.14021171
REG_ESC    1     -0.45432876        0.04653954         -9.762          0.0001          -0.21536522
REG_WNC    1     -0.03330157        0.05132077         -0.649          0.5165          -0.01384815
REG_WSC    1     -0.61891451        0.04603214        -13.445          0.0001          -0.31286684
REG_MTN    1     -0.18103984        0.06782022         -2.669          0.0077          -0.05272610
REG_PAC    1     -0.03238491        0.04315260         -0.750          0.4530          -0.01896950
```

*'L' prior to variable name indicates that the natural log of the variable was used in the analysis.

Appendix F.

Table 3. Effects of System Variables on Proportion Discharged to "Other"*
Hospitals with No Rehab Units Only (N=2404)
Only Hospital-Years with Percent Discharged to Other, SNF, and Home Greater Than 0

```
DEP VARIABLE: LDSTOTH
ANALYSIS OF VARIANCE

                   SUM OF          MEAN
SOURCE     DF     SQUARES        SQUARE        F VALUE        PROB>F

MODEL      32   178.72880    5.58527498         17.167        0.0001
ERROR    2371   771.40153    0.32534860
C TOTAL  2403   950.13033

    ROOT MSE    0.5703934      R-SQUARE         0.1881
    DEP MEAN     1.036211      ADJ R-SQ         0.1772
    C.V.         55.04609

PARAMETER ESTIMATES


                   PARAMETER        STANDARD      T FOR H0:                        STANDARDIZED
VARIABLE   DF       ESTIMATE           ERROR    PARAMETER=0      PROB > |T|            ESTIMATE

INTERCEP    1     0.78363154      1.11581097          0.702          0.4826                   0
LAGE        1    -0.26789376      0.37446181         -0.715          0.4744         -0.01417913
LGENDER     1     0.07104099      0.12608803          0.563          0.5732          0.01083171
LNODX       1     0.12385655      0.10466236          1.183          0.2368          0.02973209
SNFBED      1    -0.14268652      0.08631542         -1.653          0.0984         -0.07500801
NHOMUNIT    1     0.07354484      0.09052708          0.812          0.4166          0.03735227
TEACH       1    -0.05043816      0.04189539         -1.204          0.2287         -0.02537351
C_STGOV     1    -0.16098545      0.04093710         -3.933          0.0001         -0.07898869
C_FP        1    -0.02288541      0.04196602         -0.545          0.5856         -0.01292974
LDRG210D    1    -0.81478196      0.32567033         -2.502          0.0124         -0.06180999
SMALHOSP    1   -0.008206473      0.03499175         -0.235          0.8146        -0.005962307
LARGHOSP    1    0.005225340      0.03573215          0.146          0.8837         0.003426895
LNDIS       1    -0.18203815      0.03599877         -5.057          0.0001         -0.13974994
LNUMSURG    1    -0.06786105      0.07211954         -0.941          0.3468         -0.01877605
LDEPTCH     1     0.06368599      0.02313246          2.753          0.0059          0.05842049
LPEROUTP    1    -0.02833401      0.02018079         -1.404          0.1604         -0.05260733
LDEOUTPT    1     0.01363631      0.01017610          1.340          0.1804          0.04786539
LXHOMEDA    1     0.01454882      0.06279639          0.232          0.8168         0.006297442
LXOTHDAY    1    -0.01719371      0.03434779         -0.501          0.6167         -0.01078836
LXSNFDAY    1     0.07272878      0.05953374          1.222          0.2220          0.03350758
CHRGPDAY    1     0.15447997      0.10000532          1.545          0.1225          0.06095373
LEMCRDEP    1    0.004237460      0.04239628          0.100          0.9204         0.002126309
YEAR        1     0.04388054     0.009380561          4.678          0.0001          0.13214271
RELWT       1    -0.06042712      0.26081573         -0.232          0.8168        -0.004868308
OUTLIER     1    0.001173940     0.003584623          0.327          0.7433         0.007029149
REG_NE      1    -0.21388850      0.07029086         -3.043          0.0024         -0.06211625
REG_MA      1     0.44193105      0.04138937         10.677          0.0001          0.25780671
REG_SA      1    -0.09171150      0.04138179         -2.216          0.0268         -0.05890047
REG_ESC     1     0.07658716      0.05162091          1.484          0.1380          0.03379726
REG_WNC     1     0.05330738      0.05692417          0.936          0.3491          0.02063643
REG_WSC     1     0.13919598      0.05105811          2.726          0.0065          0.06550520
REG_MTN     1     0.21637393      0.07522509          2.876          0.0041          0.05866467
REG_PAC     1    -0.15916060      0.04786417         -3.325          0.0009         -0.08678984
```

*'L' prior to variable name indicates that the natural log of the variable was used in the analysis.

Appendix F.

Table 4. Effects of System Variables on Proportion Discharged to Home Health Services*
Hospitals with No Rehab Units Only (N=2404)
Only Hospital-Years with Percent Discharged to Other, SNF, and Home Greater Than 0

```
DEP VARIABLE: LDSTHHS
ANALYSIS OF VARIANCE

                   SUM OF           MEAN
SOURCE     DF     SQUARES         SQUARE       F VALUE       PROB>F

MODEL      32   173.76584     5.43018241        13.739       0.0001
ERROR    2371   937.09821     0.39523333
C TOTAL  2403  1110.86405

    ROOT MSE    0.6286759       R-SQUARE        0.1564
    DEP MEAN    0.7689616       ADJ R-SQ        0.1450
    C.V.         81.75647

PARAMETER ESTIMATES


                   PARAMETER         STANDARD      T FOR H0:                         STANDARDIZED
VARIABLE   DF       ESTIMATE            ERROR    PARAMETER=0      PROB > |T|             ESTIMATE

INTERCEP    1     5.96830558       1.22982391          4.853          0.0001                    0
LAGE        1    -1.86166049       0.41272411         -4.511          0.0001          -0.09112735
LGENDER     1     0.19482817       0.13897164          1.402          0.1611           0.02747266
LNODX       1     0.28072937       0.11535670          2.434          0.0150           0.06232401
SNFBED      1    -0.30017413       0.09513508         -3.155          0.0016          -0.14593487
NHOMUNIT    1     0.05362171       0.09977709          0.537          0.5910           0.02518643
TEACH       1    0.005853514       0.04617623          0.127          0.8991          0.002723322
C_STGOV     1    -0.05665887       0.04512003         -1.256          0.2093          -0.02571031
C_FP        1    -0.12338011       0.04625408         -2.667          0.0077          -0.06446700
LDRG210D    1    -0.47170992       0.35894714         -1.314          0.1889          -0.03309432
SMALHOSP    1    -0.02766141       0.03856718         -0.717          0.4733          -0.01858631
LARGHOSP    1    0.008180961       0.03938324          0.208          0.8355          0.004961942
LNDIS       1     0.01953089       0.03967710          0.492          0.6226           0.01386667
LNUMSURG    1     0.14386065       0.07948867          1.810          0.0704           0.03681178
LDEPTCH     1     0.04379491       0.02549612          1.718          0.0860           0.03715404
LPEROUTP    1     0.05445195       0.02224285          2.448          0.0144           0.09350025
LDEOUTPT    1   -0.008691467       0.01121589         -0.775          0.4385          -0.02821492
LXHOMEDA    1    -0.41191898       0.06921289         -5.951          0.0001          -0.16489565
LXOTHDAY    1     0.07733766       0.03785743          2.043          0.0412           0.04487847
LXSNFDAY    1    -0.02335147       0.06561686         -0.356          0.7220         -0.009949751
CHRGPDAY    1    -0.35262379       0.11022381         -3.199          0.0014          -0.12867698
LEMCRDEP    1     0.09113605       0.04672831          1.950          0.0513           0.04229336
YEAR        1     0.03206803       0.01033906          3.102          0.0019           0.08931094
RELWT       1    -0.28656656       0.28746573         -0.997          0.3189          -0.02135172
OUTLIER     1   -0.009361404      0.003950898         -2.369          0.0179          -0.05183927
REG_NE      1     0.31594984       0.07747314          4.078          0.0001           0.08485884
REG_MA      1    -0.31408474       0.04561851         -6.885          0.0001          -0.16945238
REG_SA      1     0.24020878       0.04561016          5.267          0.0001           0.14267405
REG_ESC     1     0.08087751       0.05689550          1.422          0.1553           0.03300764
REG_WNC     1    -0.14183087       0.06274065         -2.261          0.0239          -0.05077841
REG_WSC     1    -0.12681436       0.05627520         -2.253          0.0243          -0.05519232
REG_MTN     1    -0.37258926       0.08291155         -4.494          0.0001          -0.09342501
REG_PAC     1     0.20598220       0.05275490          3.905          0.0001           0.10387813
```

*"L" prior to variable name indicates that the natural log of the variable was used in the analysis.

Appendix F.

Table 5. Effects of System Variables on Proportion Discharged to "Rest"*
Hospitals with No Rehab Units Only (N=2404)
Only Hospital-Years with Percent Discharged to Other, SNF, and Home Greater Than 0

```
DEP VARIABLE: LDSTREST
ANALYSIS OF VARIANCE

                    SUM OF        MEAN
SOURCE     DF      SQUARES      SQUARE     F VALUE     PROB>F

MODEL      32    166.05524  5.18922623      14.814     0.0001
ERROR    2371    830.54514  0.35029318
C TOTAL  2403    996.60038

    ROOT MSE     0.5918557    R-SQUARE      0.1666
    DEP MEAN      1.082598    ADJ R-SQ      0.1554
    C.V.          54.66995

PARAMETER ESTIMATES


                     PARAMETER        STANDARD      T FOR H0:                     STANDARDIZED
VARIABLE  DF          ESTIMATE           ERROR    PARAMETER=0     PROB > |T|          ESTIMATE

INTERCEP   1       -0.46886048      1.15779588         -0.405         0.6855                 0
LAGE       1        1.55389848      0.38855178          3.999         0.0001        0.08030467
LGENDER    1       -0.02233545      0.13083238         -0.171         0.8645      -0.003325168
LNODX      1      -0.003555976      0.10860052         -0.033         0.9739      -0.000833482
SNFBED     1       -0.17636342      0.08956323         -1.969         0.0491       -0.09052411
NHOMUNIT   1        0.08907006      0.09393337          0.948         0.3431        0.04417002
TEACH      1       -0.03647165      0.04347180         -0.839         0.4016       -0.01791462
C_STGOV    1        0.04718789      0.04247745          1.111         0.2667        0.02260684
C_FP       1       -0.09257323      0.04354508         -2.126         0.0336       -0.05106786
LDRG210D   1        0.10020388      0.33792441          0.297         0.7669       0.007422204
SMALHOSP   1       -0.02093128      0.03630839         -0.576         0.5643       -0.01484857
LARGHOSP   1        0.03254849      0.03707665          0.878         0.3801        0.02084242
LNDIS      1       -0.07158696      0.03735330         -1.916         0.0554       -0.05366044
LNUMSURG   1       -0.03747348      0.07483320         -0.501         0.6166       -0.01012369
LDEPTCH    1       -0.08730798      0.02400287         -3.637         0.0003       -0.07819992
LPEROUTP   1        0.01325870      0.02094014          0.633         0.5267        0.02403644
LDEOUTPT   1       -0.01250897      0.01055900         -1.185         0.2363       -0.04287234
LXHOMEDA   1       -0.05923859      0.06515925         -0.909         0.3634       -0.02503641
LXOTHDAY   1       -0.05455020      0.03564020         -1.531         0.1260       -0.03342052
LXSNFDAY   1       -0.02484990      0.06177383         -0.402         0.6875       -0.01117873
CHRGPDAY   1       -0.51713549      0.10376824         -4.984         0.0001       -0.19923403
LEMCRDEP   1       -0.05813304      0.04399154         -1.321         0.1865       -0.02848229
YEAR       1        0.02964370     0.009733526          3.046         0.0023        0.08716352
RELWT      1        0.60575672      0.27062951          2.238         0.0253        0.04765137
OUTLIER    1       0.000722859     0.003719503          0.194         0.8459       0.004226114
REG_NE     1        0.11828465      0.07293571          1.622         0.1050        0.03354109
REG_MA     1       -0.25114439      0.04294674         -5.848         0.0001       -0.14305210
REG_SA     1       -0.03628415      0.04293887         -0.845         0.3982       -0.02275323
REG_ESC    1        0.19751073      0.05356326          3.687         0.0002        0.08510347
REG_WNC    1        0.27992124      0.05906607          4.739         0.0001        0.10580692
REG_WSC    1        0.50564281      0.05297928          9.544         0.0001        0.23233998
REG_MTN    1       -0.05076425      0.07805561         -0.650         0.5155       -0.01343881
REG_PAC    1       -0.11312074      0.04966516         -2.278         0.0228       -0.06022913
```

*'L' prior to variable name indicates that the natural log of the variable was used in the analysis.

Appendix F.

Table 6. Effects of System Variables on Deflated Total Charges*
Hospitals with No Rehab Units Only (N=2404)
Only Hospital-Years with Percent Discharged to Other, SNF, and Home Greater Than 0

```
DEP VARIABLE: LDETOTCH
ANALYSIS OF VARIANCE

                    SUM OF          MEAN
SOURCE     DF      SQUARES        SQUARE       F VALUE       PROB>F

MODEL      31    113.09756    3.64830848        58.476       0.0001
ERROR    2372    147.98933    0.06239011
C TOTAL  2403    261.08689

    ROOT MSE     0.2497801      R-SQUARE        0.4332
    DEP MEAN      9.003389      ADJ R-SQ        0.4258
    C.V.           2.77429

PARAMETER ESTIMATES

                       PARAMETER        STANDARD     T FOR H0:                         STANDARDIZED
VARIABLE   DF           ESTIMATE           ERROR   PARAMETER=0       PROB > |T|            ESTIMATE

INTERCEP    1         7.36217472      0.43998878        16.733           0.0001                   0
LAGE        1         0.09842855      0.16470471         0.598           0.5502         0.009938190
LGENDER     1        -0.05786778      0.05519661        -1.048           0.2946         -0.01683154
LNODX       1         0.15087815      0.04581005         3.294           0.0010          0.06909264
SNFBED      1         0.08298299      0.03784605         2.193           0.0284          0.08321714
NHOMUNIT    1        -0.07698677      0.03961839        -1.943           0.0521         -0.07458989
TEACH       1         0.16884069      0.01812685         9.314           0.0001          0.16203075
C_STGOV     1        -0.01411676      0.01799324        -0.785           0.4328         -0.01321333
C_FP        1         0.13468751      0.01780239         7.566           0.0001          0.14516354
LDRG210D    1         0.48636242      0.14261881         3.410           0.0007          0.07038438
SMALHOSP    1        -0.13553794      0.01516116        -8.940           0.0001         -0.18785280
LARGHOSP    1         0.09930160      0.01563595         6.351           0.0001          0.12423431
LNDIS       1        -0.16174466      0.01583519       -10.214           0.0001         -0.23687446
LNUMSURG    1         0.07198971      0.03160841         2.278           0.0228          0.03799733
LDEPTCH     1         0.23310165     0.009674956        24.093           0.0001          0.40791124
LPEROUTP    1        -0.01475414     0.008841405        -1.669           0.0953         -0.05225781
LDEOUTPT    1         0.01172237     0.004448589         2.635           0.0085          0.07849447
LDSTHOME    1         0.01471513      0.01105415         1.331           0.1833          0.02648899
LDSTOTH     1         0.01694419      0.01000082         1.694           0.0903          0.03232361
LDSTSNF     1        -0.03335709      0.01173125        -2.843           0.0045         -0.05923896
LEMCRDEP    1         0.02773845      0.01855254         1.495           0.1350          0.02655229
YEAR        1         0.01236314     0.003959045         3.123           0.0018          0.07102303
RELWT       1         0.12640401      0.11395652         1.109           0.2674          0.01942701
OUTLIER     1        0.004112487     0.001568053         2.623           0.0088          0.04697431
REG_NE      1        -0.03103961      0.03065390        -1.013           0.3114         -0.01719623
REG_MA      1         0.05474904      0.01851766         2.957           0.0031          0.06092777
REG_SA      1        -0.05675171      0.01828771        -3.103           0.0019         -0.06953012
REG_ESC     1        -0.10304855      0.02297288        -4.486           0.0001         -0.08674939
REG_WNC     1        -0.09990218      0.02481325        -4.026           0.0001         -0.07377703
REG_WSC     1        -0.18420719      0.02308264        -7.980           0.0001         -0.16536922
REG_MTN     1        -0.15381820      0.03250086        -4.733           0.0001         -0.07955701
REG_PAC     1         0.09132722      0.01954483         4.673           0.0001          0.09500197
```

*'L' prior to variable name indicates that the natural log of the variable was used in the analysis.

Appendix F.

Table 7. Effects of System Variables on Average Length of Stay*
Hospitals with No Rehab Units Only (N=2404)
Only Hospital-Years with Percent Discharged to Other, SNF, and Home Greater Than 0

```
DEP VARIABLE: LLOS
ANALYSIS OF VARIANCE

                    SUM OF          MEAN
SOURCE     DF      SQUARES        SQUARE       F VALUE       PROB>F

MODEL      31  43.52111762    1.40390702        46.167       0.0001
ERROR    2372  72.13047561    0.03040914
C TOTAL  2403    115.65159

    ROOT MSE     0.1743822      R-SQUARE        0.3763
    DEP MEAN      2.685412      ADJ R-SQ        0.3682
    C.V.          6.493683

PARAMETER ESTIMATES


                    PARAMETER        STANDARD     T FOR H0:                     STANDARDIZED
VARIABLE   DF        ESTIMATE           ERROR   PARAMETER=0      PROB > |T|         ESTIMATE

INTERCEP    1      1.89095510      0.30717495         6.156          0.0001                0
LAGE        1     0.009071762      0.11498739         0.079          0.9371      0.001376241
LGENDER     1     -0.06372810      0.03853511        -1.654          0.0983      -0.02785060
LNODX       1      0.16412743      0.03198195         5.132          0.0001       0.11292845
SNFBED      1      0.05506122      0.02642194         2.084          0.0373       0.08296335
NHOMUNIT    1     -0.03613941      0.02765929        -1.307          0.1915      -0.05260919
TEACH       1      0.01163701      0.01265513         0.920          0.3579       0.01677948
C_STGOV     1     -0.02095830      0.01256185        -1.668          0.0954      -0.02947475
C_FP        1     -0.08140384      0.01242861        -6.550          0.0001      -0.13182318
LDRG210D    1      0.05390419      0.09956828         0.541          0.5883       0.01172076
SMALHOSP    1     -0.08131454      0.01058465        -7.682          0.0001      -0.16933306
LARGHOSP    1      0.04823852      0.01091612         4.419          0.0001       0.09067677
LNDIS       1     -0.04953257      0.01105522        -4.480          0.0001      -0.10899232
LNUMSURG    1      0.06824187      0.02206718         3.092          0.0020       0.05411907
LDEPTCH     1      0.10247852     0.006754500        15.172          0.0001       0.26944485
LPEROUTP    1    -0.009441629     0.006172562        -1.530          0.1262      -0.05024593
LDEOUTPT    1    -0.002149894     0.003105750        -0.692          0.4889      -0.02163004
LDSTHOME    1      0.02143606     0.007717375         2.778          0.0055       0.05797796
LDSTOTH     1     -0.01415782     0.006981996        -2.028          0.0427      -0.04058000
LDSTSNF     1     -0.05542582     0.008190087        -6.767          0.0001      -0.14789316
LEMCRDEP    1      0.04095904      0.01295232         3.162          0.0016       0.05890964
YEAR        1     -0.03248929     0.002763978       -11.755          0.0001      -0.28043178
RELWT       1      0.20492756      0.07955791         2.576          0.0101       0.04732191
OUTLIER     1     0.000390303     0.001094725         0.357          0.7215      0.006698455
REG_NE      1      0.11629192      0.02140080         5.434          0.0001       0.09680173
REG_MA      1      0.03710099      0.01292797         2.870          0.0041       0.06203560
REG_SA      1     -0.02705267      0.01276743        -2.119          0.0342      -0.04979903
REG_ESC     1     -0.05584454      0.01603835        -3.482          0.0005      -0.07063533
REG_WNC     1     -0.10412776      0.01732319        -6.011          0.0001      -0.11553923
REG_WSC     1     -0.09900561      0.01611498        -6.144          0.0001      -0.13354408
REG_MTN     1     -0.20769502      0.02269024        -9.153          0.0001      -0.16140373
REG_PAC     1     -0.17669463      0.01364508       -12.949          0.0001      -0.27616741
```

*'L' prior to variable name indicates that the natural log of the variable was used in the analysis.

Appendix G

Detailed Regression Results: Hospitals with Rehab Units Only

Appendix G.

Table 1. Effects of System Variables on Proportion Discharged Home*
Hospitals with Rehab Units Only (N=708)
Only Hospital-Years with Percent Discharged to Other, SNF, and Home Greater Than 0

```
DEP VARIABLE: LDSTHOME
ANALYSIS OF VARIANCE

                    SUM OF          MEAN
SOURCE     DF      SQUARES        SQUARE        F VALUE       PROB>F

MODEL      32  75.15884902    2.34871403         10.416       0.0001
ERROR     675    152.20460    0.22548830
C TOTAL   707    227.36345

    ROOT MSE     0.4748561      R-SQUARE         0.3306
    DEP MEAN      1.776274      ADJ R-SQ         0.2988
    C.V.          26.73327

PARAMETER ESTIMATES

                     PARAMETER        STANDARD      T FOR H0:                       STANDARDIZED
VARIABLE   DF         ESTIMATE           ERROR    PARAMETER=0      PROB > |T|           ESTIMATE

INTERCEP    1       4.97669610      1.80766632          2.753          0.0061                  0
LAGE        1      -1.31371457      0.64938240         -2.023          0.0435        -0.07153203
LGENDER     1      -0.08231708      0.20364488         -0.404          0.6862        -0.01396346
LNODX       1      -0.29593668      0.15486276         -1.911          0.0564        -0.08092396
SNFBED      1      -0.12463472      0.10777705         -1.156          0.2479        -0.08412186
NHOMUNIT    1      -0.07040640      0.11431837         -0.616          0.5382        -0.04450044
TEACH       1       0.08639319      0.05034052          1.716          0.0866         0.06626084
C_STGOV     1      -0.12235974      0.07674845         -1.594          0.1113        -0.05827461
C_FP        1      -0.18656472      0.16136334         -1.156          0.2480        -0.04249598
LDRG210D    1      -1.93283575      1.05844372         -1.826          0.0683        -0.11478851
SMALHOSP    1       0.02032250      0.11219621          0.181          0.8563        0.006489837
LARGHOSP    1      0.001719970      0.05387091          0.032          0.9745        0.001517510
LNDIS       1       0.04526622      0.06484142          0.698          0.4854         0.04114194
LNUMSURG    1       0.10994739      0.11394921          0.965          0.3350         0.03403440
LDEPTCH     1       0.01898604      0.03111497          0.610          0.5419         0.02275588
LPEROUTP    1       0.04287262      0.02871574          1.493          0.1359         0.09624882
LDEOUTPT    1      -0.03132635      0.01534117         -2.042          0.0415        -0.12405805
LXHOMEDA    1       0.36167476      0.09733869          3.716          0.0002         0.17439731
LXOTHDAY    1       0.06560934      0.05152335          1.273          0.2033         0.04669652
LXSNFDAY    1      -0.05304963      0.08428212         -0.629          0.5293        -0.02920191
CHRGPDAY    1       0.12034905      0.15319352          0.786          0.4324         0.04872416
LEMCRDEP    1      -0.11618719      0.07366040         -1.577          0.1152        -0.06021465
YEAR        1      -0.08733347      0.01350664         -6.466          0.0001        -0.30074447
RELWT       1      -0.32133786      0.40972534         -0.784          0.4332        -0.02815962
OUTLIER     1     -0.004051182     0.005401589         -0.750          0.4535        -0.02668505
REG_NE      1      -0.03389932      0.09120900         -0.372          0.7103        -0.01331301
REG_MA      1       0.04018793      0.06406298          0.627          0.5307         0.02540083
REG_SA      1       0.38470267      0.07628892          5.043          0.0001         0.20263180
REG_ESC     1       0.27978207      0.13749604          2.035          0.0423         0.06873638
REG_WNC     1     -0.004715654      0.07252354         -0.065          0.9482       -0.002758705
REG_WSC     1       0.10075883      0.08594813          1.172          0.2415         0.04337797
REG_MTN     1       0.51175590      0.09022912          5.672          0.0001         0.20352375
REG_PAC     1       0.02273011      0.06789796          0.335          0.7379         0.01474247
```

*"L" prior to variable name indicates that the natural log of the variable was used in the analysis.

Appendix G.

Table 2. Effects of System Variables on Proportion Discharged to an SNF*
Hospitals with Rehab Units Only (N=708)
Only Hospital-Years with Percent Discharged to Other, SNF, and Home Greater Than 0

```
DEP VARIABLE: LDSTSNF
ANALYSIS OF VARIANCE

                     SUM OF        MEAN
SOURCE      DF      SQUARES      SQUARE      F VALUE      PROB>F

MODEL       32  59.31562454  1.85361327        6.888      0.0001
ERROR      675    181.64157  0.26909863
C TOTAL    707    240.95720

    ROOT MSE      0.5187472     R-SQUARE       0.2462
    DEP MEAN       1.919132     ADJ R-SQ       0.2104
    C.V.           27.03031

PARAMETER ESTIMATES

                       PARAMETER        STANDARD      T FOR H0:                     STANDARDIZED
VARIABLE  DF            ESTIMATE           ERROR    PARAMETER=0     PROB > |T|          ESTIMATE

INTERCEP   1         -0.59896713      1.97474944         -0.303         0.7617                 0
LAGE       1          2.37519410      0.70940501          3.348         0.0009        0.12562874
LGENDER    1         -0.22479941      0.22246784         -1.010         0.3126       -0.03704149
LNODX      1          0.40088251      0.16917677          2.370         0.0181        0.10648436
SNFBED     1         -0.19590223      0.11773891         -1.664         0.0966       -0.12843978
NHOMUNIT   1          0.30353188      0.12488486          2.430         0.0153        0.18635749
TEACH      1          0.03838626      0.05499351          0.698         0.4854        0.02859852
C_STGOV    1         -0.01060798      0.08384233         -0.127         0.8994      -0.004907541
C_FP       1          0.28167869      0.17627820          1.598         0.1105        0.06232505
LDRG210D   1         -1.13114443      1.15627598         -0.978         0.3283       -0.06525471
SMALHOSP   1          0.03839140      0.12256654          0.313         0.7542        0.01190916
LARGHOSP   1         -0.11378989      0.05885021         -1.934         0.0536       -0.09752249
LNDIS      1          0.17118129      0.07083473          2.417         0.0159        0.15113228
LNUMSURG   1         -0.36348623      0.12448157         -2.920         0.0036       -0.10929782
LDEPTCH    1         -0.02609371      0.03399094         -0.768         0.4430       -0.03037985
LPEROUTP   1         -0.04803376      0.03136994         -1.531         0.1262       -0.10474959
LDEOUTPT   1          0.03377355      0.01675916          2.015         0.0443        0.12992188
LXHOMEDA   1         -0.21819667      0.10633574         -2.052         0.0406       -0.10220216
LXOTHDAY   1          0.02085419      0.05628567          0.371         0.7111        0.01441792
LXSNFDAY   1         -0.40060097      0.09207234         -4.351         0.0001       -0.21420581
CHRGPDAY   1         -0.28794615      0.16735324         -1.721         0.0858       -0.11324091
LEMCRDEP   1          0.09924663      0.08046885          1.233         0.2179        0.04996318
YEAR       1          0.01891841      0.01475506          1.282         0.2002        0.06328372
RELWT      1         -0.17402760      0.44759637         -0.389         0.6975       -0.01481404
OUTLIER    1         0.004834753     0.005900860          0.819         0.4129        0.03093506
REG_NE     1         -0.04575211      0.09963947         -0.459         0.6463       -0.01745367
REG_MA     1         -0.11776910      0.06998434         -1.683         0.0929       -0.07230593
REG_SA     1         -0.06541141      0.08334033         -0.785         0.4328       -0.03346773
REG_ESC    1         -0.51306142      0.15020484         -3.416         0.0007       -0.12244091
REG_WNC    1          0.01646669      0.07922691          0.208         0.8354       0.009357507
REG_WSC    1         -0.41157957      0.09389234         -4.384         0.0001       -0.17211957
REG_MTN    1         -0.08394666      0.09856903         -0.852         0.3947       -0.03242993
REG_PAC    1          0.11498617      0.07417379          1.550         0.1216        0.07244438
```

*"L" prior to variable name indicates that the natural log of the variable was used in the analysis.

Appendix G.

Table 3. Effects of System Variables on Proportion Discharged to "Other"*
Hospitals with Rehab Units Only (N=708)
Only Hospital-Years with Percent Discharged to Other, SNF, and Home Greater Than 0

```
DEP VARIABLE: LDSTOTH
ANALYSIS OF VARIANCE

                   SUM OF         MEAN
SOURCE     DF     SQUARES       SQUARE       F VALUE       PROB>F

MODEL      32   128.62499   4.01953103        10.989       0.0001
ERROR     675   246.90231   0.36578120
C TOTAL   707   375.52730

    ROOT MSE    0.6047985     R-SQUARE        0.3425
    DEP MEAN     1.181722     ADJ R-SQ        0.3113
    C.V.         51.17943

PARAMETER ESTIMATES

                    PARAMETER        STANDARD     T FOR H0:                      STANDARDIZED
VARIABLE   DF        ESTIMATE           ERROR   PARAMETER=0      PROB > |T|          ESTIMATE

INTERCEP    1     -0.80304018      2.30232670        -0.349          0.7274                 0
LAGE        1     -1.28820678      0.82708320        -1.558          0.1198       -0.05457889
LGENDER     1      0.43817173      0.25937146         1.689          0.0916        0.05783448
LNODX       1      0.06678336      0.19724031         0.339          0.7350        0.01420974
SNFBED      1      0.13425141      0.13726979         0.978          0.3284        0.07050635
NHOMUNIT    1      0.05525492      0.14560112         0.379          0.7044        0.02717457
TEACH       1     -0.05235153      0.06411599        -0.817          0.4145       -0.03124254
C_STGOV     1      0.06812148      0.09775034         0.697          0.4861        0.02524437
C_FP        1     -0.32526000      0.20551975        -1.583          0.1140       -0.05764857
LDRG210D    1      3.26963617      1.34808245         2.425          0.0156        0.15109234
SMALHOSP    1     -0.11096964      0.14289823        -0.777          0.4377       -0.02757404
LARGHOSP    1     0.007570285      0.06861246         0.110          0.9122       0.005197117
LNDIS       1     -0.28041506      0.08258501        -3.395          0.0007       -0.19831312
LNUMSURG    1     -0.12746478      0.14513094        -0.878          0.3801       -0.03070174
LDEPTCH     1     -0.02143778      0.03962946        -0.541          0.5887       -0.01999304
LPEROUTP    1     -0.04681029      0.03657368        -1.280          0.2010       -0.08177043
LDEOUTPT    1      0.01823678      0.01953921         0.933          0.3510        0.05619569
LXHOMEDA    1      0.14928179      0.12397502         1.204          0.2290        0.05601031
LXOTHDAY    1     -0.13363374      0.06562250        -2.036          0.0421       -0.07400730
LXSNFDAY    1      0.50825616      0.10734558         4.735          0.0001        0.21769632
CHRGPDAY    1      0.30878172      0.19511429         1.583          0.1140        0.09727312
LEMCRDEP    1      0.13786643      0.09381726         1.470          0.1422        0.05559581
YEAR        1      0.06234830      0.01720267         3.624          0.0003        0.16706332
RELWT       1      0.66759149      0.52184498         1.279          0.2012        0.04552136
OUTLIER     1     0.002995105     0.006879712         0.435          0.6634        0.01535104
REG_NE      1     -0.56434067      0.11616796        -4.858          0.0001       -0.17245114
REG_MA      1      0.38017341      0.08159355         4.659          0.0001        0.18697067
REG_SA      1     -0.39144050      0.09716507        -4.029          0.0001       -0.16043079
REG_ESC     1      0.29736439      0.17512126         1.698          0.0900        0.05684540
REG_WNC     1     -0.10423053      0.09236931        -1.128          0.2595       -0.04744581
REG_WSC     1      0.05968084      0.10946748         0.545          0.5858        0.01999220
REG_MTN     1     -0.35926050      0.11491995        -3.126          0.0018       -0.11117350
REG_PAC     1     -0.46785756      0.08647796        -5.410          0.0001       -0.23611410
```

*"L" prior to variable name indicates that the natural log of the variable was used in the analysis.

Appendix G.

Table 4. Effects of System Variables on Proportion Discharged to Home Health Services*
Hospitals with Rehab Units Only (N=708)
Only Hospital-Years with Percent Discharged to Other, SNF, and Home Greater Than 0

```
DEP VARIABLE: LDSTHHS
ANALYSIS OF VARIANCE

                      SUM OF          MEAN
SOURCE      DF       SQUARES        SQUARE       F VALUE         PROB>F

MODEL       32   69.30588764    2.16580899         7.070         0.0001
ERROR      675     206.79116    0.30635728
C TOTAL    707     276.09705

    ROOT MSE       0.5534955      R-SQUARE        0.2510
    DEP MEAN       0.6815242      ADJ R-SQ        0.2155
    C.V.            81.21436

PARAMETER ESTIMATES


                      PARAMETER        STANDARD      T FOR H0:                    STANDARDIZED
VARIABLE   DF          ESTIMATE           ERROR    PARAMETER=0     PROB > |T|        ESTIMATE

INTERCEP    1        4.51733702      2.10702825          2.144         0.0324               0
LAGE        1       -1.12924168      0.75692458         -1.492         0.1362     -0.05579764
LGENDER     1        0.47735774      0.23736987          2.011         0.0447      0.07348122
LNODX       1        0.21062076      0.18050910          1.167         0.2437      0.05226476
SNFBED      1        0.06170205      0.12562567          0.491         0.6235      0.03779191
NHOMUNIT    1       -0.29070752      0.13325028         -2.182         0.0295     -0.16673926
TEACH       1      -0.005524075      0.05867725         -0.094         0.9250    -0.003844735
C_STGOV     1        0.11062936      0.08945852          1.237         0.2166      0.04781242
C_FP        1        0.64133156      0.18808621          3.410         0.0007      0.13256545
LDRG210D    1       -1.25640093      1.23372925         -1.018         0.3089     -0.06771130
SMALHOSP    1        0.18960977      0.13077667          1.450         0.1476      0.05494737
LARGHOSP    1        0.08388807      0.06279230          1.336         0.1820      0.06716459
LNDIS       1        0.18298706      0.07557961          2.421         0.0157      0.15092472
LNUMSURG    1        0.33215078      0.13281998          2.501         0.0126      0.09330349
LDEPTCH     1        0.05409824      0.03626783          1.492         0.1363      0.05883990
LPEROUTP    1        0.04622958      0.03347126          1.381         0.1677      0.09418132
LDEOUTPT    1        0.01502527      0.01788177          0.840         0.4011      0.05399665
LXHOMEDA    1       -0.50241667      0.11345865         -4.428         0.0001     -0.21984422
LXOTHDAY    1        0.01398693      0.06005597          0.233         0.8159     0.009033807
LXSNFDAY    1        0.08789542      0.09823982          0.895         0.3713      0.04390607
CHRGPDAY    1       -0.66049539      0.17856342         -3.699         0.0002     -0.24266153
LEMCRDEP    1      -0.007357914      0.08585907         -0.086         0.9317    -0.003460414
YEAR        1        0.04599305      0.01574343          2.921         0.0036      0.14372706
RELWT       1       -0.49416489      0.47757866         -1.035         0.3012     -0.03929762
OUTLIER     1       -0.01003731     0.006296129         -1.594         0.1114     -0.05999748
REG_NE      1        0.36886229      0.10631384          3.470         0.0006      0.13145553
REG_MA      1       -0.27427411      0.07467225         -3.673         0.0003     -0.15731366
REG_SA      1       -0.07961638      0.08892289         -0.895         0.3709     -0.03805522
REG_ESC     1        0.12934011      0.16026632          0.807         0.4199      0.02883563
REG_WNC     1       -0.18244115      0.08453394         -2.158         0.0313     -0.09685357
REG_WSC     1       -0.19231552      0.1001817          -1.920         0.0553     -0.07513284
REG_MTN     1       -0.45412130      0.10517168         -4.318         0.0001     -0.16389042
REG_PAC     1        0.23214178      0.07914233          2.933         0.0035      0.13663169
```

*"L" prior to variable name indicates that the natural log of the variable was used in the analysis.

Appendix G.

Table 5. Effects of System Variables on Proportion Discharged to "Rest"*
Hospitals with Rehab Units Only (N=708)
Only Hospital-Years with Percent Discharged to Other, SNF, and Home Greater Than 0

```
DEP VARIABLE: LDSTREST
ANALYSIS OF VARIANCE

                      SUM OF         MEAN
SOURCE      DF       SQUARES       SQUARE       F VALUE       PROB>F

MODEL       32   43.63446285   1.36357696         4.461       0.0001
ERROR      675     206.32551   0.30566742
C TOTAL    707     249.95997

    ROOT MSE      0.552872     R-SQUARE        0.1746
    DEP MEAN       1.08158     ADJ R-SQ        0.1354
    C.V.          51.11706

PARAMETER ESTIMATES


                     PARAMETER        STANDARD      T FOR H0:                      STANDARDIZED
VARIABLE  DF          ESTIMATE           ERROR    PARAMETER=0       PROB > |T|         ESTIMATE

INTERCEP   1        2.04569782      2.10465460          0.972           0.3314                0
LAGE       1        1.30109061      0.75607187          1.721           0.0857       0.06756661
LGENDER    1       -0.23808898      0.23710247         -1.004           0.3157      -0.03851832
LNODX      1        0.04781816      0.18030575          0.265           0.7909       0.01247086
SNFBED     1        0.28433219      0.12548415          2.266           0.0238       0.18302943
NHOMUNIT   1       -0.12756396      0.13310017         -0.958           0.3382      -0.07689627
TEACH      1       -0.10642723      0.05861115         -1.816           0.0698      -0.07784940
C_STGOV    1       -0.04646266      0.08935774         -0.520           0.6033      -0.02110425
C_FP       1        0.01903111      0.18787433          0.101           0.9193      0.004134353
LDRG210D   1        0.04357238      1.23233941          0.035           0.9718      0.002467970
SMALHOSP   1       -0.16977730      0.13062934         -1.300           0.1942      -0.05170844
LARGHOSP   1        0.13925220      0.06272156          2.220           0.0267       0.11717578
LNDIS      1       -0.10287052      0.07549446         -1.363           0.1735      -0.08917160
LNUMSURG   1        0.20672413      0.13267036          1.558           0.1197       0.06103086
LDEPTCH    1        0.01411100      0.03622697          0.390           0.6970       0.01613029
LPEROUTP   1        0.03233415      0.03343355          0.967           0.3338       0.06923121
LDEOUTPT   1      -0.008136398      0.01786162         -0.456           0.6489      -0.03073070
LXHOMEDA   1       -0.05906905      0.11333083         -0.521           0.6024      -0.02716481
LXOTHDAY   1       -0.04342267      0.05998831         -0.724           0.4694      -0.02947545
LXSNFDAY   1       -0.34279104      0.09812915         -3.493           0.0005      -0.17996309
CHRGPDAY   1       -0.65904997      0.17836226         -3.695           0.0002      -0.25447501
LEMCRDEP   1       -0.06846248      0.08576234         -0.798           0.4250      -0.03383933
YEAR       1        0.02563759      0.01572569          1.630           0.1035       0.08420137
RELWT      1        0.31504460      0.47704065          0.660           0.5092       0.02633068
OUTLIER    1      -0.007176375     0.006289037         -1.141           0.2542      -0.04508338
REG_NE     1        0.09672895      0.10619407          0.911           0.3627       0.03622987
REG_MA     1       -0.28608555      0.07458813         -3.836           0.0001      -0.17245397
REG_SA     1       -0.03216610      0.08882271         -0.362           0.7174      -0.01615868
REG_ESC    1        0.25476249      0.16008578          1.591           0.1120       0.05969355
REG_WNC    1        0.13912052      0.08443871          1.648           0.0999       0.07762108
REG_WSC    1        0.36849976      0.10006887          3.682           0.0002       0.15130329
REG_MTN    1       -0.10800975      0.10505320         -1.028           0.3043      -0.04096758
REG_PAC    1        0.03171870      0.07905318          0.401           0.6884       0.01962046
```

*"L" prior to variable name icates that the natural log of the variable was used in the analysis.

Appendix G.

Table 6. Effects of System Variables on Deflated Total Charges*
Hospitals with Rehab Units Only (N=708)
Only Hospital-Years with Percent Discharged to Other, SNF, and Home Greater Than 0

```
DEP VARIABLE: LDETOTCH
ANALYSIS OF VARIANCE

                      SUM OF          MEAN
SOURCE     DF        SQUARES        SQUARE       F VALUE        PROB>F

MODEL      31    50.83211985    1.63974580        24.994        0.0001
ERROR     676    44.34996725    0.06560646
C TOTAL   707    95.18208710

    ROOT MSE       0.2561376      R-SQUARE        0.5341
    DEP MEAN        9.008594      ADJ R-SQ        0.5127
    C.V.            2.843258

PARAMETER ESTIMATES

                      PARAMETER        STANDARD      T FOR H0:                       STANDARDIZED
VARIABLE   DF          ESTIMATE           ERROR    PARAMETER=0       PROB > |T|          ESTIMATE

INTERCEP    1        9.60092061      0.89112389         10.774           0.0001                 0
LAGE        1       -0.41930514      0.35115622         -1.194           0.2329       -0.03528681
LGENDER     1       -0.14187933      0.10957040         -1.295           0.1958       -0.03719673
LNODX       1        0.15560779      0.08381713          1.857           0.0638        0.06576463
SNFBED      1        0.08779108      0.05786808          1.517           0.1297        0.09158048
NHOMUNIT    1       -0.07485798      0.06194568         -1.208           0.2273       -0.07312619
TEACH       1        0.17673239      0.02686402          6.579           0.0001        0.20949626
C_STGOV     1       -0.03057372      0.04103701         -0.745           0.4565       -0.02250463
C_FP        1        0.11530899      0.08686379          1.327           0.1848        0.04059422
LDRG210D    1        1.63353510      0.57176338          2.857           0.0044        0.14993901
SMALHOSP    1       -0.25713873      0.05958684         -4.315           0.0001       -0.12691324
LARGHOSP    1        0.13796517      0.02874750          4.799           0.0001        0.18813209
LNDIS       1       -0.31057562      0.03480226         -8.924           0.0001       -0.43627530
LNUMSURG    1        0.37479488      0.06122273          6.122           0.0001        0.17931208
LDEPTCH     1        0.20252082      0.01608851         12.588           0.0001        0.37515586
LPEROUTP    1       0.000851806      0.01552798          0.055           0.9563       0.002955554
LDEOUTPT    1       0.006462718     0.008281397          0.780           0.4354        0.03955607
LDSTHOME    1        0.01930127      0.02440437          0.791           0.4293        0.02983105
LDSTOTH     1       0.001430923      0.02029999          0.070           0.9438       0.002842231
LDSTSNF     1       -0.06046537      0.02359677         -2.562           0.0106       -0.09620531
LEMCRDEP    1        0.01419406      0.03946431          0.360           0.7192        0.01136929
YEAR        1        0.01024561     0.007155492          1.432           0.1526        0.05453027
RELWT       1       -0.19045128      0.22016358         -0.865           0.3873       -0.02579476
OUTLIER     1       0.007322750     0.002904546          2.521           0.0119        0.07454923
REG_NE      1        0.07949475      0.04889130          1.626           0.1044        0.04825100
REG_MA      1        0.06808747      0.03484215          1.954           0.0511        0.06651232
REG_SA      1       -0.01621118      0.04185252         -0.387           0.6986       -0.01319713
REG_ESC     1        0.11275189      0.07487398          1.506           0.1326        0.04281277
REG_WNC     1       -0.06835247      0.03901093         -1.752           0.0802       -0.06180169
REG_WSC     1       -0.19954092      0.04665872         -4.277           0.0001       -0.13277024
REG_MTN     1        0.11037911      0.04890590          2.257           0.0243        0.06784563
REG_PAC     1        0.08531157      0.03582676          2.381           0.0175        0.08551836
```

*"L" prior to variable name icates that the natural log of the variable was used in the analysis.

Appendix G.

Table 7. Effects of System Variables on Average Length of Stay*
Hospitals with Rehab Units Only (N=708)
Only Hospital-Years with Percent Discharged to Other, SNF, and Home Greater Than 0

```
DEP VARIABLE: LLOS
ANALYSIS OF VARIANCE

                    SUM OF         MEAN
SOURCE      DF     SQUARES       SQUARE        F VALUE       PROB>F

MODEL       31  16.04793658   0.51767537        16.605       0.0001
ERROR      676  21.07509708   0.03117618
C TOTAL    707  37.12303366

    ROOT MSE      0.1765678     R-SQUARE        0.4323
    DEP MEAN       2.702329     ADJ R-SQ        0.4063
    C.V.           6.533911

PARAMETER ESTIMATES


                      PARAMETER        STANDARD      T FOR H0:                        STANDARDIZED
VARIABLE  DF           ESTIMATE           ERROR    PARAMETER=0       PROB > |T|           ESTIMATE

INTERCEP   1         3.85065429      0.61429394          6.268           0.0001                  0
LAGE       1        -0.59531223      0.24206863         -2.459           0.0142        -0.08022005
LGENDER    1        -0.10872553      0.07553207         -1.439           0.1505        -0.04564288
LNODX      1         0.08155975      0.05777912          1.412           0.1585         0.05519412
SNFBED     1        -0.07997002      0.03989121         -2.005           0.0454        -0.13357820
NHOMUNIT   1         0.03780485      0.04270209          0.885           0.3763         0.05913413
TEACH      1         0.06306273      0.01851864          3.405           0.0007         0.11969852
C_STGOV    1        -0.04857805      0.02828875         -1.717           0.0864        -0.05725581
C_FP       1        -0.09403018      0.05987933         -1.570           0.1168        -0.05300589
LDRG210D   1         0.31398500      0.39414360          0.797           0.4259         0.04614779
SMALHOSP   1        -0.09412755      0.04107603         -2.292           0.0222        -0.07438957
LARGHOSP   1         0.07056582      0.01981702          3.561           0.0004         0.15407909
LNDIS      1        -0.11651312      0.02399085         -4.857           0.0001        -0.26207404
LNUMSURG   1         0.12455255      0.04220373          2.951           0.0033         0.09541671
LDEPTCH    1         0.06399618      0.01109057          5.770           0.0001         0.18982438
LPEROUTP   1         0.01341090      0.01070417          1.253           0.2107         0.07450952
LDEOUTPT   1       -0.009063399     0.005708760         -1.588           0.1128        -0.08882698
LDSTHOME   1         0.01889621      0.01682309          1.123           0.2617         0.04676419
LDSTOTH    1        0.006697890      0.01399375          0.479           0.6324         0.02130282
LDSTSNF    1        -0.03376709      0.01626637         -2.076           0.0383        -0.08602841
LEMCRDEP   1         0.07608762      0.02720462          2.797           0.0053         0.09758804
YEAR       1        -0.02581684     0.004932620         -5.234           0.0001        -0.22001822
RELWT      1         0.06800729      0.15176919          0.448           0.6542         0.01474888
OUTLIER    1        0.000841368     0.002002242          0.420           0.6745         0.01371548
REG_NE     1         0.25252409      0.03370309          7.493           0.0001         0.24542940
REG_MA     1        -0.02815608      0.02401835         -1.172           0.2415        -0.04404159
REG_SA     1         0.05478703      0.02885093          1.899           0.0580         0.07141653
REG_ESC    1         0.04164163      0.05161418          0.807           0.4201         0.02531822
REG_WNC    1        -0.06474480      0.02689208         -2.408           0.0163        -0.09373609
REG_WSC    1        -0.11187868      0.03216407         -3.478           0.0005        -0.11919883
REG_MTN    1        -0.09305970      0.03371315         -2.760           0.0059        -0.09159093
REG_PAC    1        -0.12456836      0.02469708         -5.044           0.0001        -0.19994707
```

*"L" prior to variable name .icates that the natural log of the variable was used in the analysis.

Appendix H

Detailed Regression Results: Hospitals beginning Rehab Units 1986/87

Appendix H.

Table 1. Effects of System Variables on Proportion Discharged Home*
Hospitals Starting Rehab Units in 1986 or 1987 Only (N=316)
Only Hospital-Years with Percent Discharged to Other, SNF, and Home Greater Than 0

```
DEP VARIABLE: LDSTHOME
ANALYSIS OF VARIANCE

                         SUM OF           MEAN
SOURCE       DF         SQUARES         SQUARE       F VALUE       PROB>F

MODEL        32     56.21341287     1.75666915         8.243       0.0001
ERROR       283     60.31085524     0.21311256
C TOTAL     315       116.52427

    ROOT MSE          0.4616412       R-SQUARE        0.4824
    DEP MEAN           1.631171       ADJ R-SQ        0.4239
    C.V.               28.30121

PARAMETER ESTIMATES

                           PARAMETER         STANDARD      T FOR H0:                        STANDARDIZED
VARIABLE    DF              ESTIMATE            ERROR    PARAMETER=0       PROB > |T|           ESTIMATE

INTERCEP     1           14.86269855       2.74414574          5.416           0.0001                  0
LAGE         1           -3.09394085       0.94468582         -3.275           0.0012        -0.16010088
LGENDER      1            0.16632864       0.37092985          0.448           0.6542         0.02124303
LNODX        1           -0.72932071       0.23620128         -3.088           0.0022        -0.19516419
SNFBED       1           -0.12751719       0.12151986         -1.049           0.2949        -0.08018584
NHOMUNIT     1           0.000020645       0.14887415          0.000           0.9999        0.000010802
TEACH        1            0.29950007       0.09480456          3.159           0.0018         0.18964111
C_STGOV      1            0.34630662       0.11191174          3.094           0.0022         0.14204623
C_FP         1            0.10908329       0.14689811          0.743           0.4584         0.03819754
LDRG210D     1            0.30597904       1.60236721          0.191           0.8487         0.01625707
SMALHOSP     1           -0.10504402       0.10957538         -0.959           0.3386        -0.04835601
LARGHOSP     1            0.12715850       0.09567940          1.329           0.1849         0.10304379
LNDIS        1           -0.26343235       0.11135970         -2.366           0.0187        -0.24085983
LNUMSURG     1            0.09155391       0.18069381          0.507           0.6128         0.02610676
LDEPTCH      1           -0.18659395       0.08049172         -2.318           0.0212        -0.13326660
LPEROUTP     1           -0.01018999       0.04186642         -0.243           0.8079        -0.02141217
LDEOUTPT     1           0.008529252       0.02227182          0.383           0.7020         0.03186026
LXHOMEDA     1            0.03986300       0.13453758          0.296           0.7672         0.01875415
LXOTHDAY     1           -0.02428448       0.08674255         -0.280           0.7797        -0.01550027
LXSNFDAY     1           -0.03888985       0.15775522         -0.247           0.8055        -0.01819089
CHRGPDAY     1           -0.99331161       0.25984897         -3.823           0.0002        -0.41552851
LEMCRDEP     1           -0.09813788       0.09223391         -1.064           0.2882        -0.05344575
YEAR         1           -0.02938193       0.02208506         -1.330           0.1845        -0.09230311
RELWT        1           -0.20046188       0.60039663         -0.334           0.7387        -0.01688326
OUTLIER      1          -0.006373072      0.008049312         -0.792           0.4292        -0.03939375
REG_NE       1           -0.30744422       0.16041234         -1.917           0.0563        -0.09677028
REG_MA       1            0.28531314       0.13685540          2.085           0.0380         0.10889663
REG_SA       1            0.03735459       0.11708561          0.319           0.7499         0.01775956
REG_ESC      1            0.29254374       0.14350375          2.039           0.0424         0.11452336
REG_WNC      1            0.04768672       0.10738530          0.444           0.6573         0.02582962
REG_WSC      1    0.5[illegible]58472       0.10660659          5.352           0.0001         0.31898358
REG_MTN      1    0.4[illegible]28174       0.12103202          3.605           0.0004         0.21060028
REG_PAC      1    0.[illegible]11102       0.12068685          3.158           0.0018         0.23270376

*"L" prior to variable name indicates that the natural log of the variable was used in the analysis.
```

Appendix H.

Table 2. Effects of System Variables on Proportion Discharged to an SNF*
Hospitals Starting Rehab Units in 1986 or 1987 Only (N=316)
Only Hospital-Years with Percent Discharged to Other, SNF, and Home Greater Than 0

```
DEP VARIABLE: LDSTSNF
ANALYSIS OF VARIANCE

                    SUM OF          MEAN
SOURCE      DF     SQUARES        SQUARE        F VALUE       PROB>F

MODEL       32  49.47541647   1.54610676          7.567       0.0001
ERROR      283  57.82384549   0.20432454
C TOTAL    315    107.29926

    ROOT MSE     0.4520227     R-SQUARE          0.4611
    DEP MEAN      1.990925     ADJ R-SQ          0.4002
    C.V.          22.70416

PARAMETER ESTIMATES


                      PARAMETER        STANDARD     T FOR H0:                        STANDARDIZED
VARIABLE  DF           ESTIMATE           ERROR   PARAMETER=0       PROB > |T|           ESTIMATE

INTERCEP   1         0.30475383      2.68697060         0.113           0.9098                  0
LAGE       1         0.68027507      0.92500299         0.735           0.4627         0.03668395
LGENDER    1        -0.35542927      0.36320141        -0.979           0.3286        -0.04730560
LNODX      1         0.02330688      0.23127996         0.101           0.9198        0.006499436
SNFBED     1        -0.06678257      0.11898796        -0.561           0.5751        -0.04376248
NHOMUNIT   1         0.28480877      0.14577231         1.954           0.0517         0.15528936
TEACH      1         0.12070265      0.09282927         1.300           0.1946         0.07964568
C_STGOV    1         0.01476740      0.10958002         0.135           0.8929        0.006312228
C_FP       1        -0.04251531      0.14383744        -0.296           0.7678        -0.01551431
LDRG210D   1         3.39802070      1.56898138         2.166           0.0312         0.18814233
SMALHOSP   1         0.06585110      0.10729234         0.614           0.5399         0.03159017
LARGHOSP   1         0.03324398      0.09368589         0.355           0.7230         0.02807367
LNDIS      1         0.12558098      0.10903948         1.152           0.2504         0.11965448
LNUMSURG   1         0.35618549      0.17692900         2.013           0.0450         0.10584299
LDEPTCH    1         0.19912417      0.07881465         2.526           0.0121         0.14820320
LPEROUTP   1        -0.05462933      0.04099412        -1.333           0.1837        -0.11962520
LDEOUTPT   1        0.000985754      0.02180778         0.045           0.9640        0.003837219
LXHOMEDA   1        -0.26207106      0.13173445        -1.989           0.0476        -0.12848613
LXOTHDAY   1         0.04671928      0.08493524         0.550           0.5827         0.03107538
LXSNFDAY   1        -0.44961441      0.15446834        -2.911           0.0039        -0.21916332
CHRGPDAY   1         0.16703081      0.25443493         0.656           0.5121         0.07281515
LEMCRDEP   1        -0.03819439      0.09031218        -0.423           0.6727        -0.02167634
YEAR       1        0.003610527      0.02162491         0.167           0.8675         0.01181997
RELWT      1         0.32189399      0.58788718         0.548           0.5844         0.02825187
OUTLIER    1        0.000333292     0.007881602         0.042           0.9663        0.002146909
REG_NE     1        -0.46934112      0.15707010        -2.988           0.0031        -0.15394802
REG_MA     1        -0.41334238      0.13400398        -3.085           0.0022        -0.16440401
REG_SA     1        -0.63415531      0.11464609        -5.531           0.0001        -0.31419095
REG_ESC    1        -0.80170830      0.14051380        -5.706           0.0001        -0.32706156
REG_WNC    1        -0.16457624      0.10514789        -1.565           0.1187        -0.09289609
REG_WSC    1        -0.94315031      0.10438541        -9.035           0.0001        -0.54946360
REG_MTN    1        -0.48294783      0.11851023        -4.075           0.0001        -0.24294164
REG_PAC    1        -0.29244766      0.11817230        -2.475           0.0139        -0.18608436
```

*'L' prior to variable name indicates that the natural log of the variable was used in the analysis.

Appendix H.

Table 3. Effects of System Variables on Proportion Discharged to "Other"*
Hospitals Starting Rehab Units in 1986 or 1987 Only (N=316)
Only Hospital-Years with Percent Discharged to Other, SNF, and Home Greater Than 0

```
DEP VARIABLE: LDSTOTH
ANALYSIS OF VARIANCE

                   SUM OF          MEAN
SOURCE     DF     SQUARES         SQUARE         F VALUE       PROB>F

MODEL      32  48.89677764    1.52802430          5.135        0.0001
ERROR     283  84.21446121    0.29757760
C TOTAL   315    133.11124

    ROOT MSE     0.5455067      R-SQUARE          0.3673
    DEP MEAN       1.07064      ADJ R-SQ          0.2958
    C.V.          50.95146

PARAMETER ESTIMATES

                     PARAMETER        STANDARD      T FOR H0:                        STANDARDIZED
VARIABLE  DF          ESTIMATE           ERROR    PARAMETER=0      PROB > |T|            ESTIMATE

INTERCEP   1       -1.66964565      3.24267009         -0.515          0.6070                   0
LAGE       1       -0.30228643      1.11630531         -0.271          0.7867         -0.01463529
LGENDER    1       -0.33734051      0.43831606         -0.770          0.4422         -0.04031056
LNODX      1       -0.21135182      0.27911157         -0.757          0.4495         -0.05291617
SNFBED     1       -0.01159615      0.14359617         -0.081          0.9357        -0.006822502
NHOMUNIT   1       -0.41875062      0.17591986         -2.380          0.0180         -0.20499102
TEACH      1       -0.05148434      0.11202754         -0.460          0.6462         -0.03050082
C_STGOV    1       -0.32763241      0.13224255         -2.478          0.0138         -0.12573512
C_FP       1       -0.15975172      0.17358484         -0.920          0.3582         -0.05233877
LDRG210D   1       -2.49384437      1.89346657         -1.317          0.1889         -0.12397121
SMALHOSP   1        0.21925528      0.12948175          1.693          0.0915          0.09443434
LARGHOSP   1       -0.37108637      0.11306132         -3.282          0.0012         -0.28135345
LNDIS      1        0.24054598      0.13159022          1.828          0.0686          0.20577575
LNUMSURG   1       -0.53517150      0.21352015         -2.506          0.0128         -0.14278081
LDEPTCH    1        0.04139635      0.09511452          0.435          0.6637          0.02766219
LPEROUTP   1        0.03069812      0.04947223          0.621          0.5354          0.06035309
LDEOUTPT   1        0.01644223      0.02631791          0.625          0.5326          0.05746454
LXHOMEDA   1        0.11882623      0.15897880          0.747          0.4554          0.05230467
LXOTHDAY   1       -0.20936181      0.10250092         -2.043          0.0420         -0.12502845
LXSNFDAY   1        0.32410032      0.18641435          1.739          0.0832          0.14183980
CHRGPDAY   1        0.37698915      0.30705529          1.228          0.2206          0.14755197
LEMCRDEP   1       -0.03894109      0.10898988         -0.357          0.7211         -0.01984200
YEAR       1        0.11990900      0.02609722          4.595          0.0001          0.35244273
RELWT      1        0.93692488      0.70946968          1.321          0.1877          0.07382953
OUTLIER    1       0.002175444     0.009511617          0.229          0.8193          0.01258135
REG_NE     1       -0.47012762      0.18955418         -2.480          0.0137         -0.13844978
REG_MA     1        0.59349538      0.16171770          3.670          0.0003          0.21193897
REG_SA     1       -0.26844352      0.13835635         -1.940          0.0533         -0.11941035
REG_ESC    1        0.33043728      0.16957383          1.949          0.0523          0.12103003
REG_WNC    1       -0.30686586      0.12689381         -2.418          0.0162         -0.15551413
REG_WSC    1        0.13541066      0.12597363          1.075          0.2833          0.07082749
REG_MTN    1        0.17702102      0.14301971          1.238          0.2168          0.07994983
REG_PAC    1       -0.34741782      0.14261182         -2.436          0.0155         -0.19847455
```

*'L' prior to variable name indicates that the natural log of the variable was used in the analysis.

Appendix H.

Table 4. Effects of System Variables on Proportion Discharged to Home Health Services*
Hospitals Starting Rehab Units in 1986 or 1987 Only (N=316)
Only Hospital-Years with Percent Discharged to Other, SNF, and Home Greater Than 0

```
DEP VARIABLE: LDSTHHS
ANALYSIS OF VARIANCE

                   SUM OF         MEAN
SOURCE    DF      SQUARES       SQUARE       F VALUE       PROB>F

MODEL     32  53.83011612   1.68219113         5.852       0.0001
ERROR    283  81.34736817   0.28744653
C TOTAL  315    135.17748

    ROOT MSE    0.5361404     R-SQUARE        0.3982
    DEP MEAN    0.8228522     ADJ R-SQ        0.3302
    C.V.         65.15634

PARAMETER ESTIMATES


                   PARAMETER        STANDARD      T FOR H0:                     STANDARDIZED
VARIABLE  DF        ESTIMATE           ERROR    PARAMETER=0     PROB > |T|          ESTIMATE

INTERCEP   1      8.67282918      3.18699353          2.721         0.0069                 0
LAGE       1     -3.63087264      1.09713838         -3.309         0.0011       -0.17444107
LGENDER    1      0.06286896      0.43079018          0.146         0.8841       0.007454900
LNODX      1      0.98744914      0.27431924          3.600         0.0004        0.24533095
SNFBED     1     -0.08239939      0.14113063         -0.584         0.5598       -0.04810707
NHOMUNIT   1     -0.27753913      0.17289932         -1.605         0.1096       -0.13482138
TEACH      1     -0.30994397      0.11010403         -2.815         0.0052       -0.18221108
C_STGOV    1      0.01529616      0.12997195          0.118         0.9064       0.005825154
C_FP       1      0.32905038      0.17060439          1.929         0.0548        0.10697827
LDRG210D   1      0.13186476      1.86095580          0.071         0.9436       0.006504822
SMALHOSP   1      0.09511898      0.12725856          0.747         0.4554        0.04065390
LARGHOSP   1      0.04858729      0.11112006          0.437         0.6623        0.03655570
LNDIS      1      0.04912594      0.12933082          0.380         0.7043        0.04170251
LNUMSURG   1     -0.55981988      0.20985402         -2.668         0.0081       -0.14821098
LDEPTCH    1      0.23697853      0.09348141          2.535         0.0118        0.15714073
LPEROUTP   1      0.06015855      0.04862279          1.237         0.2170        0.11736546
LDEOUTPT   1     -0.01970333      0.02586603         -0.762         0.4468       -0.06833355
LXHOMEDA   1     -0.29790750      0.15624914         -1.907         0.0576       -0.13012622
LXOTHDAY   1     -0.02554733      0.10074098         -0.254         0.8000       -0.01513952
LXSNFDAY   1     -0.32759023      0.18321362         -1.788         0.0748       -0.14226720
CHRGPDAY   1     -0.59293073      0.30178316         -1.965         0.0504       -0.23029011
LEMCRDEP   1      0.07206765      0.10711853          0.673         0.5016        0.03643954
YEAR       1     -0.03087358      0.02564913         -1.204         0.2297       -0.09004901
RELWT      1      0.26977498      0.69728811          0.387         0.6991        0.02109513
OUTLIER    1     0.000621231     0.009348303          0.066         0.9471       0.003565231
REG_NE     1      0.87230013      0.18629954          4.682         0.0001        0.25491631
REG_MA     1     -0.26336961      0.15894101         -1.657         0.0986       -0.09332851
REG_SA     1      0.46666347      0.13598078          3.432         0.0007        0.20599090
REG_ESC    1      0.52514622      0.16666225          3.151         0.0018        0.19087082
REG_WNC    1      0.22707237      0.12471505          1.821         0.0697        0.11419334
REG_WSC    1     -0.39416636      0.12381066         -3.184         0.0016       -0.20458970
REG_MTN    1      0.01159411      0.14056406          0.082         0.9343       0.005196195
REG_PAC    1      0.41202682      0.14016318          2.940         0.0036        0.23357879
```

*"L" prior to variable name indicates that the natural log of the variable was used in the analysis.

Appendix H.

Table 5. Effects of System Variables on Proportion Discharged to "Rest"*
Hospitals Starting Rehab Units in 1986 or 1987 Only (N=316)
Only Hospital-Years with Percent Discharged to Other, SNF, and Home Greater Than 0

```
DEP VARIABLE: LDSTREST
ANALYSIS OF VARIANCE

                       SUM OF          MEAN
SOURCE      DF        SQUARES        SQUARE         F VALUE         PROB>F

MODEL       32    45.88668266    1.43395883           4.616         0.0001
ERROR      283    87.91506626    0.31065394
C TOTAL    315      133.80175

    ROOT MSE        0.5573634      R-SQUARE          0.3429
    DEP MEAN         1.175564      ADJ R-SQ          0.2686
    C.V.             47.41242

PARAMETER ESTIMATES


                        PARAMETER        STANDARD       T FOR H0:                        STANDARDIZED
VARIABLE    DF           ESTIMATE           ERROR     PARAMETER=0         PROB > |T|          ESTIMATE

INTERCEP     1        -5.97176177      3.31314988          -1.802             0.0725                 0
LAGE         1         4.49637509      1.14056833           3.942             0.0001        0.21713085
LGENDER      1         0.51050568      0.44784291           1.140             0.2553        0.06084535
LNODX        1         0.30970787      0.28517809           1.086             0.2784        0.07734124
SNFBED       1         0.10661521      0.14671725           0.727             0.4680        0.06256413
NHOMUNIT     1        0.004055963      0.17974350           0.023             0.9820       0.001980386
TEACH        1        -0.20607296      0.11446247          -1.800             0.0729       -0.12176820
C_STGOV      1        -0.36098817      0.13511686          -2.672             0.0080       -0.13817809
C_FP         1         0.02260852      0.17735773           0.127             0.8987       0.007387995
LDRG210D     1        -1.75805360      1.93462128          -0.909             0.3643       -0.08716860
SMALHOSP     1        -0.19821446      0.13229605          -1.498             0.1352       -0.08515138
LARGHOSP     1         0.08253463      0.11551872           0.714             0.4755        0.06241514
LNDIS        1        -0.13048181      0.13445035          -0.970             0.3326       -0.11133265
LNUMSURG     1         0.08606734      0.21816103           0.395             0.6935        0.02290297
LDEPTCH      1        -0.31320811      0.09718185          -3.223             0.0014       -0.20875364
LPEROUTP     1         0.04835703      0.05054751           0.957             0.3396        0.09482522
LDEOUTPT     1         0.01006401      0.02688993           0.374             0.7085        0.03508220
LXHOMEDA     1         0.18414017      0.16243422           1.134             0.2579        0.08084501
LXOTHDAY     1        -0.06037803      0.10472879          -0.577             0.5647       -0.03596390
LXSNFDAY     1         0.33646243      0.19046609           1.767             0.0784        0.14686952
CHRGPDAY     1        -0.09652217      0.31372918          -0.308             0.7586       -0.03768076
LEMCRDEP     1         0.12238943      0.11135879           1.099             0.2727        0.06220105
YEAR         1       -0.003600313      0.02666444          -0.135             0.8927       -0.01055489
RELWT        1        -1.42172772      0.72489008          -1.961             0.0508       -0.11174247
OUTLIER      1       -0.009326158     0.009718353          -0.960             0.3381       -0.05379706
REG_NE       1         0.71434987      0.19367416           3.688             0.0003        0.20982824
REG_MA       1         0.01796672      0.16523265           0.109             0.9135       0.006399393
REG_SA       1         0.49922098      0.14136354           3.531             0.0005        0.22149215
REG_ESC      1         0.33738620      0.17325954           1.947             0.0525        0.12325595
REG_WNC      1         0.38503001      0.12965186           2.970             0.0032        0.19462218
REG_WSC      1         0.68958590      0.12871168           5.358             0.0001        0.35976082
REG_MTN      1         0.21587998      0.14612826           1.477             0.1407        0.09724820
REG_PAC      1        -0.04777724      0.14571151          -0.328             0.7432       -0.02722389
```

*"L" prior to variable name indicates that the natural log of the variable was used in the analysis.

Appendix H.

Table 6. Effects of System Variables on Deflated Total Charges*
Hospitals Starting Rehab Units in 1986 or 1987 Only (N=316)
Only Hospital-Years with Percent Discharged to Other, SNF, and Home Greater Than 0

```
DEP VARIABLE: LDETOTCH
ANALYSIS OF VARIANCE

                  SUM OF         MEAN
SOURCE     DF     SQUARES       SQUARE       F VALUE       PROB>F

MODEL      31  15.91475663  0.51337925        14.322       0.0001
ERROR     284  10.18023259  0.03584589
C TOTAL   315  26.09498922

    ROOT MSE     0.1893301    R-SQUARE        0.6099
    DEP MEAN       8.99716    ADJ R-SQ        0.5673
    C.V.          2.104332

PARAMETER ESTIMATES


                    PARAMETER        STANDARD       T FOR H0:                        STANDARDIZED
VARIABLE  DF         ESTIMATE           ERROR     PARAMETER=0     PROB > |T|              ESTIMATE

INTERCEP   1       6.16155654      1.02461185           6.014         0.0001                     0
LAGE       1       0.23722986      0.39278315           0.604         0.5463            0.02594064
LGENDER    1      -0.29541843      0.15035191          -1.965         0.0504           -0.07972908
LNODX      1       0.12714087      0.09765448           1.302         0.1940            0.07189462
SNFBED     1       0.07807114      0.04990379           1.564         0.1188            0.10374068
NHOMUNIT   1      -0.06056717      0.06175617          -0.981         0.3276           -0.06696462
TEACH      1       0.12842968      0.03956170           3.246         0.0013            0.17184251
C_STGOV    1      -0.05925529      0.04682491          -1.265         0.2067           -0.05136008
C_FP       1       0.15324150      0.05888659           2.602         0.0097            0.11339220
LDRG210D   1       0.79886634      0.66077180           1.209         0.2277            0.08969215
SMALHOSP   1      -0.16627443      0.04489429          -3.704         0.0003           -0.16174623
LARGHOSP   1       0.01640677      0.03997405           0.410         0.6818            0.02809501
LNDIS      1      -0.04500258      0.04615047          -0.975         0.3303           -0.08694854
LNUMSURG   1       0.23420908      0.07417049           3.158         0.0018            0.14112677
LDEPTCH    1       0.34907376      0.02901313          12.032         0.0001            0.52683013
LPEROUTP   1      -0.01612538      0.01713786          -0.941         0.3475           -0.07160221
LDEOUTPT   1       0.02196383     0.009087593           2.417         0.0163            0.17337085
LDSTHOME   1     -0.003623485      0.02594015          -0.140         0.8890          -0.007656955
LDSTOTH    1       0.02045267      0.02176281           0.940         0.3481            0.04619328
LDSTSNF    1      -0.02116712      0.02772426          -0.763         0.4458           -0.04292216
LEMCRDEP   1       0.06066666      0.03762276           1.612         0.1080            0.06981620
YEAR       1       0.01612844     0.008908221           1.811         0.0713            0.10706760
RELWT      1       0.21250319      0.24499908           0.867         0.3865            0.03781983
OUTLIER    1      0.004415553     0.003284836           1.344         0.1799            0.05767574
REG_NE     1      0.005030779      0.06950359           0.072         0.9423           0.003346113
REG_MA     1       0.05024303      0.05704101           0.881         0.3792            0.04052268
REG_SA     1       0.08219179      0.05169918           1.590         0.1130            0.08257457
REG_ESC    1      -0.07221748      0.06026525          -1.198         0.2318           -0.05974138
REG_WNC    1       0.01670524      0.04435865           0.377         0.7068            0.01912066
REG_WSC    1      -0.07487171      0.04890917          -1.531         0.1269           -0.08844954
REG_MTN    1      -0.13249422      0.04527641          -2.926         0.0037           -0.13515076
REG_PAC    1       0.08538512      0.04086325           2.090         0.0375            0.11017009
```

*"L" prior to variable name indicates that the natural log of the variable was used in the analysis.

Appendix H.

Table 7. Effects of System Variables on Average Length of Stay*
Hospitals Starting Rehab Units in 1986 or 1987 Only (N=316)
Only Hospital-Years with Percent Discharged to Other, SNF, and Home Greater Than 0

```
DEP VARIABLE: LLOS
ANALYSIS OF VARIANCE

                     SUM OF         MEAN
SOURCE      DF      SQUARES       SQUARE      F VALUE       PROB>F

MODEL       31  10.49746220   0.33862781       17.479       0.0001
ERROR      284   5.50210855   0.01937362
C TOTAL    315  15.99957075

    ROOT MSE      0.1391892     R-SQUARE       0.6561
    DEP MEAN       2.686131     ADJ R-SQ       0.6186
    C.V.           5.181771

PARAMETER ESTIMATES

                     PARAMETER        STANDARD      T FOR H0:                      STANDARDIZED
VARIABLE  DF          ESTIMATE           ERROR    PARAMETER=0     PROB > |T|           ESTIMATE

INTERCEP   1        1.15362755      0.75326034          1.532         0.1268                  0
LAGE       1        0.03754208      0.28876103          0.130         0.8966        0.005242689
LGENDER    1       -0.09811024      0.11053369         -0.888         0.3755        -0.03381566
LNODX      1        0.20469100      0.07179230          2.851         0.0047         0.14782040
SNFBED     1       0.007778625      0.03668759          0.212         0.8322         0.01320036
NHOMUNIT   1       -0.03343554      0.04540107         -0.736         0.4621        -0.04721074
TEACH      1        0.04172575      0.02908444          1.435         0.1525         0.07130069
C_STGOV    1       -0.02006201      0.03442411         -0.583         0.5605        -0.02220739
C_FP       1       -0.07560186      0.04329145         -1.746         0.0818        -0.07144365
LDRG210D   1        0.06795883      0.48577731          0.140         0.8888        0.009744299
SMALHOSP   1       -0.08332947      0.03300478         -2.525         0.0121        -0.10352178
LARGHOSP   1       0.004825292      0.02938759          0.164         0.8697         0.01055247
LNDIS      1      -0.000795504      0.03392828         -0.023         0.9813       -0.001962871
LNUMSURG   1        0.14399474      0.05452766          2.641         0.0087         0.11080942
LDEPTCH    1        0.23721948      0.02132948         11.122         0.0001         0.45722307
LPEROUTP   1       -0.01975078      0.01259918         -1.568         0.1181        -0.11200184
LDEOUTPT   1        0.01033549     0.006680894          1.547         0.1230         0.10418935
LDSTHOME   1        0.06220979      0.01907033          3.262         0.0012         0.16788533
LDSTOTH    1       -0.01685062      0.01599929         -1.053         0.2931        -0.04860367
LDSTSNF    1       -0.05013040      0.02038195         -2.460         0.0145        -0.12982112
LEMCRDEP   1        0.04716735      0.02765900          1.705         0.0892         0.06932215
YEAR       1       -0.02235811     0.006549026         -3.414         0.0007        -0.18955056
RELWT      1        0.05642471      0.18011513          0.313         0.7543         0.01282472
OUTLIER    1      -0.002933521     0.002414902         -1.215         0.2255        -0.04893525
REG_NE     1        0.09829794      0.05109672          1.924         0.0554         0.08349763
REG_MA     1       -0.09230644      0.04193464         -2.201         0.0285        -0.09507770
REG_SA     1        0.07487913      0.03800751          1.970         0.0498         0.09607337
REG_ESC    1       -0.15477670      0.04430499         -3.493         0.0006        -0.16351700
REG_WNC    1       -0.07069330      0.03261099         -2.168         0.0310        -0.10333627
REG_WSC    1       -0.11696552      0.03595638         -3.253         0.0013        -0.17646561
REG_MTN    1       -0.27540934      0.03328570         -8.274         0.0001        -0.35877701
REG_PAC    1       -0.29479292      0.03004129         -9.813         0.0001        -0.48576138
```

*"L" prior to variable name indicates that the natural log of the variable was used in the analysis.

Appendix I

Table 1: Correlation of Residuals from Regressions for Discharge Destinations, Total Charges, and Average Length of Stay: Hospitals Starting Rehab Units in 1986 or 1987 Only

Appendix I

Table 1
Correlations between Residuals from Regressions for Discharge Destinations, Total Charges, and Average Length of Stay
Hospitals Starting Rehab Units in 1986 or 1987 Only
Only Hospital/Years with Percent Discharged to Other, SNF, and Home Greater Than 0
(N=316)

PEARSON CORRELATION COEFFICIENTS

	RHOME	RSNF	RHHS	ROTH	RREST	RCHG	RLOS
RHOME	1.0000						
RESIDUALS	0.0000						
RSNF	-0.3685	1.0000					
RESIDUALS	0.0001	0.0000					
RHHS	-0.4469	0.1251	1.0000				
RESIDUALS	0.0001	0.0262	0.0000				
ROTH	-0.0629	-0.2959	-0.1952	1.0000			
RESIDUALS	0.2650	0.0001	0.0005	0.0000			
RREST	-0.1413	-0.4285	0.0649	-0.1278	1.0000		
RESIDUALS	0.0119	0.0001	0.2499	0.0231	0.0000		
RCHG	-0.0565	0.1162	0.0545	-0.0163	-0.0265	1.0000	
RESIDUALS	0.3168	0.0390	0.3343	0.7725	0.6390	0.0000	
RLOS	-0.2872	0.2437	0.1135	0.0354	-0.0507	0.5559	1.0000
RESIDUALS	0.0001	0.0001	0.0437	0.5305	0.3688	0.0001	0.0000

Pearson Correlation Coefficients
Probability> |R| UNDER H0:RHO=0

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